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INFORMATION PROCESSING PERSONNEL SURVEY

1968

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AFIPS PRESS

INFORMATION PROCESSING PERSONNEL SURVEY 1968

Conducted by
The American Federation of
Information Processing Societies (AFIPS)

The Data Processing Management
Association (DPMA)

The Numerical Control Society (NCS)

Sponsored by
The Advanced Research Projects Agency
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and

The American Federation of
Information Processing Societies

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International Computing Company

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PREFACE

This Information Processing Personnel Survey is the result of the dedicated work of many people, not the least of whom are the 29,826 individuals who completed the survey questionnaires. To all I would like to express the thanks of the participating societies. Special credit is due to Ike Nehama and Mal Davis who were the prime movers in developing the questionnaire and managing the large job of analysing the returns. Without their enthusiasm and hard work this survey could not have been conducted.

Paul Armer
President, A F I P S

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I. BACKGROUND

One of the consequences of the continuous fast rate of growth of the Information Processing field has been the lack of accurate quantitative information about other significant aspects of the field besides hardware. A great deal of authoritative information is available about the current status and change with time of almost every facet of hardware from electronic devices to components to complex systems. Considerable data also exist on the application of computers and their impact on specific areas. Beyond this, e.g., software and personnel, the availability of accurate (quantitative) information falls off rapidly and is replaced by estimates. This is true even of questions about hardware in a large socio-economic context, e.g., how many computers of what classes are installed? What are they being used for? What is the aggregate annual capital investment in computer based systems?

An awareness of the importance and usefulness of accurate data on all aspects of the Information Processing field in planning for education, research, development, investment has not been lacking among individuals and organizations in the field. Until 1966, however, no concerted effort had ever been made to establish a systematic data gathering activity. At that time, the professional societies making up the American Federation of Information Processing Societies (AFIPS), decided to initiate an effort in this direction. The aspect of the field selected for survey personnel was a natural one for professional societies, in that access to a source of data, i.e., their membership, was readily available. A successful precedent in this type of survey had already been established by one of the member societies of AFIPS. In 1956, 1958 and 1960, the Professional Group on Electronic Computers (PGEC) of the Institute of Radio Engineers (IRE) conducted membership surveys and published valuable data on electrical engineers working in the computer field.

Other organizations which sponsor or conduct regular surveys of scientific and technical personnel in the U.S., similarly have covered only segments of the computer personnel population. Perhaps such partial coverage can be explained by the fact that to date most of the individuals who work in the field of Automatic Data Processing have entered it after working in some other field.

The participation of AFIPS member societies in a personnel survey of their membership guaranteed a broader base than prior surveys. The decision by the Data Processing Management Association (DPMA), whose members are predominantly involved in business and management data processing, and the Numerical Control Society (NCS) to join in this activity went a long way towards complete coverage of the occupational specialties in the field.

In May 1967, this organized effort by the principal societies in information processing received contract support from the Department of Defense Advanced Research Projects Agency (ARPA) to conduct the survey, and process and publish the results.

The professional societies participating in the survey were:

AFIPS Member Societies (in 1967):

The Association for Computing Machinery, Inc. (ACM)

The Association for Computational Linguistics (ACL)

The American Society for Information Science (ASIS) (formerly The American Documentation Institute (ADI))

The Institute of Electrical and Electronics Engineers, Inc. Computer Group (IEEE CG)

The Special Libraries Association (SLA)

The Simulation Councils, Inc. (SCI)

The Data Processing Management Association (DPMA)

The Numerical Control Society (NCS)

II. OBJECTIVES OF THE INFORMATION PROCESSING PERSONNEL SURVEY

The principal objectives of the survey were:

A. To obtain data characterizing the professional make-up of the members of the participating societies. Such data should be descriptive of professional categories, activities and other factors of employment in the field of information processing.

B. To make the results of the survey available to the membership and the general public through the media of the participating societies.

III. CONDUCT OF THE SURVEY RESPONSIBILITIES AND CHRONOLOGY

A. The activities involved in conducting the survey were carried out in three phases:

1. Design of the survey questionnaire;
   Specification of the machine analyses of the data from the responses;
   Printing and mailing of questionnaires.
2. Handling of returns;
   Coding and keypunching.
   Processing of the data and generation of tables by computer.
3. Manual analysis of machine-produced results.
   Preparation of final report.

A working committee of representatives of the participating societies (see Appendix A) performed the work in phases 1 and 3. The Computer Usage Company (CUC) was selected from three bidders as subcontractor for the activities in phase 2.

B. Individual questions in the questionnaire (a copy of which is included in Appendix B) are discussed in the presentation of findings section of this report. In Appendix B, the design of the questionnaire is examined in some detail to point out a number of difficult demographic problems encountered in formulating questions and, in the light of hindsight, the glaringly bad compromises made, as indicated implicitly in the responses and explicitly in comments made by respondents.

Two important guidelines were followed in the design of the questionnaire, and the subsequent handling and processing of the returns.

The first was to preserve the anonymity of respondents. The questionnaire included no questions as to name, address, employer identification (other than government), etc., which could be used to trace the identity of a respondent. The questionnaires bore no mark or code which could be correlated with the mailing of the questionnaires to individual members. Questionnaires, all of identical content and format, were printed on paper of different colors each of which was associated with a participating society. This was originally done because several societies had expressed a desire to obtain raw data from the questionnaires completed by their members, so they could perform analyses in greater depth than would be practical for the entire population. Subsequently it became possible to satisfy this desire by making the data available to the societies in machine readable form (magnetic tape). Ultimately all questionnaires were destroyed, except for those belonging to DPMA which are in the custody of DPMA, and a 10% random sample of the remainder which are in the custody of AFIPS.

CUC established procedures for the secure handling of survey returns and subsequent processing, as outlined in Appendix C.

The second guideline concerned the statistical validity of the results. The question arose as to how to ensure that members belonging to more than one society and who thus were bound to receive more than one questionnaire, would complete and return only one. The rule on anonymity precluded detection of such an occurrence, and an ironclad guarantee against it could not be made. The means ultimately chosen was to include a prominent notice with each mailing, requesting recipients to mail back only one completed survey questionnaire, regardless of the number of blanks received.

C. General statistics on, and a chronology of key milestones of, the mailing and returns of the survey questionnaire are given below:

Total combined membership of participating societies (estimated at time of mailing)	70,000 (approx.)
Total number of questionnaires mailed by the societies*	70,000 (approx.)
Mailing begun	First week Dec., 1967
Mailing completed	End December, 1967
Number of returns received by March 1, 1968 and ultimately processed	29,826
Number of returns received after March 1, 1968 and not processed	84
Machine processing begun	March 1, 1968
Machine processing completed	October 20, 1968

*Due to an unfortunate concatenation of clerical slip-ups, ACL was unable to mail questionnaires to its members (approximately 400). 108 returns, showing membership in ACL, were received from individuals belonging to at least one other participating society.

IV. PRESENTATION OF MAJOR FINDINGS

The questions used in the survey can be grouped into five major categories:

- Personal Data
- Education
- Employment
- Professional Activities
- Salary and Income

The major findings of the survey are presented in this section of the report, with the exception of those for salary and income for which all graphs have been placed in Appendix D.

Two basic procedures were used to derive the results. The first consisted of simply tallying the answers to a single question and showing them as straight distributions. In the second, answers to several questions were combined to determine some particular characteristics. In such cases, it often turned out that the total population having these characteristics in common was smaller than the total survey population. Occasionally, such shrinking results also from respondents failing to answer one, or more, of a set of questions.

The methods used in deriving salary and income information were more elaborate and are discussed in the appropriate section.

The findings of this report are for the entire population of the survey taken as a whole. The right to conduct and publish comparable analyses of the data by individual societies has, by agreement, been retained by the societies.

OVERALL SURVEY STATISTICS

The number of questionnaires mailed by each participating society is given in Table 1, which also shows the number of respondents reporting membership in that society (data derived from responses to Question 25). The total number of mentions of society membership was 33,621. In Section IV.D, Table 4 shows the pair wise overlap in membership between societies. The minimum yield of the survey (i.e., fraction of individuals out of the total who responded) is given by

$$\text{Yield} = \frac{33,621}{69,751} = 0.482 \text{ or } 48.2\%$$

TABLE 1

Number of Respondents reporting Membership in participating Societies

Society	Number of Q. Mailed	Membership Reported	Number of Q. Returned (by Society)*
ACM	20,662	12,032	10,581
ACL		108	1
ASIS	2,500	1,306	689
DPMA	25,001	11,009	10,540
IEEE-CG	11,902	5,879	5,254
NCS	1,200	480	446
SCI	1,602	882	599
SLA	6,834	1,925	1,716
Total	69,751	33,621	29,826

*These entries which were determined by color coding of the questionnaire should not be used to calculate yield from each society. Members belonging to more than one society received more than one questionnaire. The mailing was not simultaneous, and it is impossible to say which one was the first to be received.

A. PERSONAL DATA

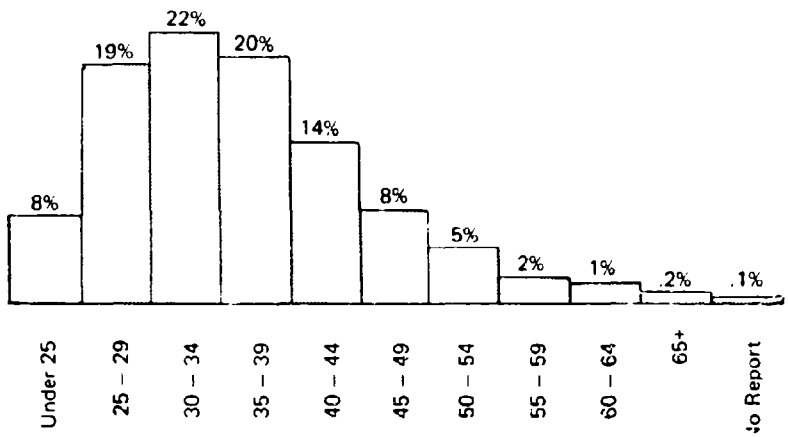
Age - Sex

(Questions 1, 2)

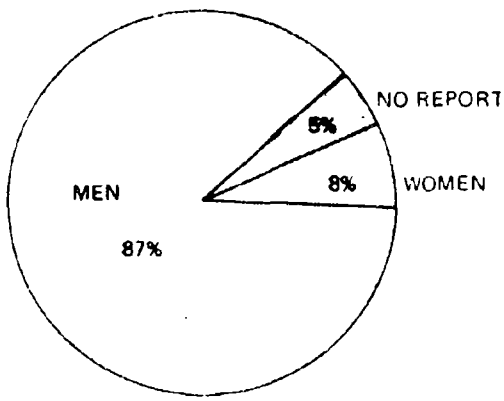
The survey shows that the median age of the total group is 34.

CHART 1 – AGE AND SEX

Total Survey Population: 29,826



AGE



SEX

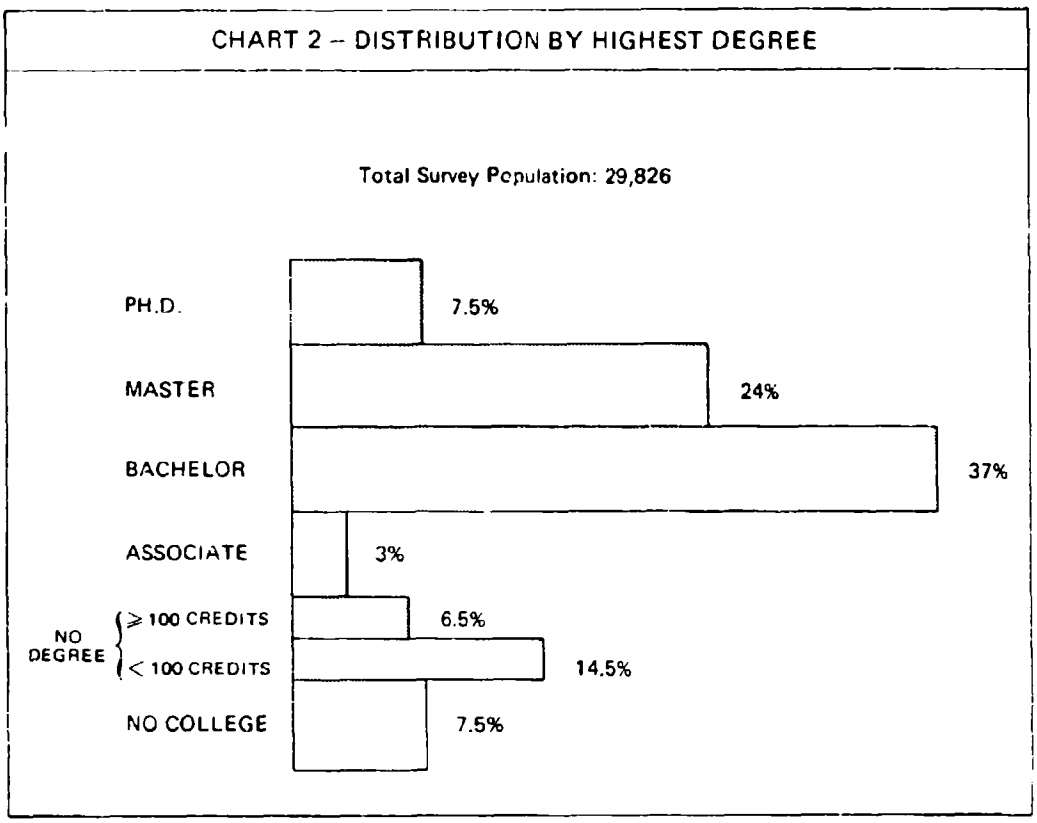
B. EDUCATION

Degree Levels and Disciplines

(Questions 3, 4 and 5)

This set of questions was answered by all respondents, or a total of 29,826. About 68% held at least a Bachelor's degree, while 31% held at least a Master's degree. 7.5% had doctorates and 3% had Associate of Arts degrees. 21% had done college work, and 7.5% did not attend college. The distribution by level of highest degree is shown in Chart 2.

CHART 2 -- DISTRIBUTION BY HIGHEST DEGREE

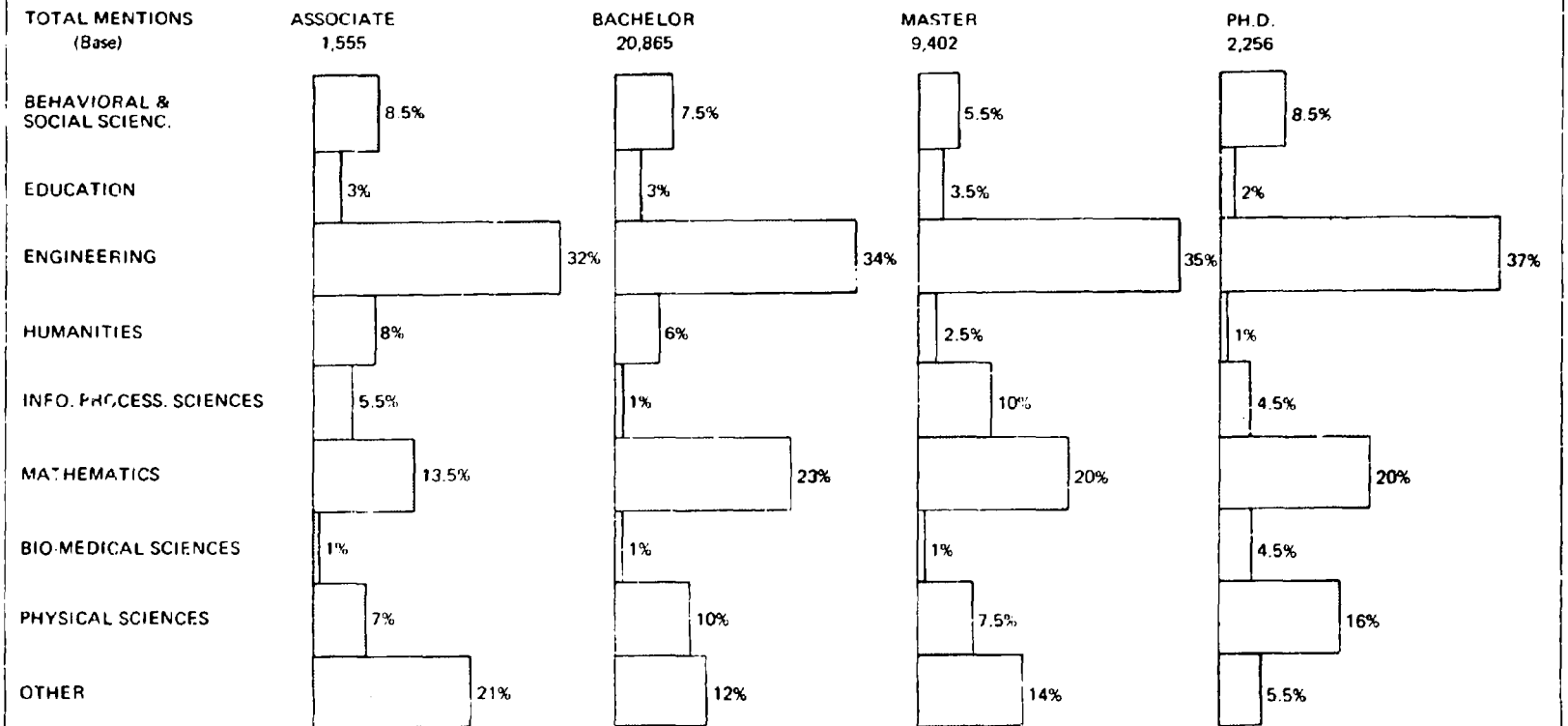


There were 32,504 responses from individuals holding Associate of Arts, or higher, degrees. The number of *responses* is derived by counting only once for each degree level held, i.e., ignoring the possibility of a respondent holding several degrees of identical level in different disciplines. The number of *mentions* is derived by not ignoring such a possibility, i.e., counting once for each degree listed by a respondent. (For example, if a respondent had listed a B.S., M.S., and Ph.D. in mathematics and a B.S. in one of the physical sciences, the number of *mentions* would be 4.) There were 34,078 total *mentions* in the survey (Question 6).

CHART 3 – DISTRIBUTION OF DISCIPLINES LEVEL OF HIGHEST DEGREE

Number of Responses: 32,504
Number of Mentions: 34,078

Total number holding degrees. 21,360
Total Survey Population: 29,826



C. EMPLOYMENT

1. *Connection of Job with Computers; Type of Equipment Used*

Connection of Job with Computers (Question 7):

Respondents were asked to indicate (Yes or No) whether their job was primarily connected with computers or data processing. Of the total survey population of 29,826, 82.5% answered "yes", 16.5% answered "no", and 1% gave no response (see also Chart 5).

Type of Computing Equipment Used in Work (Question 8):

24,322 respondents answered this question. Since multiple entries were permitted, the total number of mentions was 26,706. The distribution of answers is tabulated below:

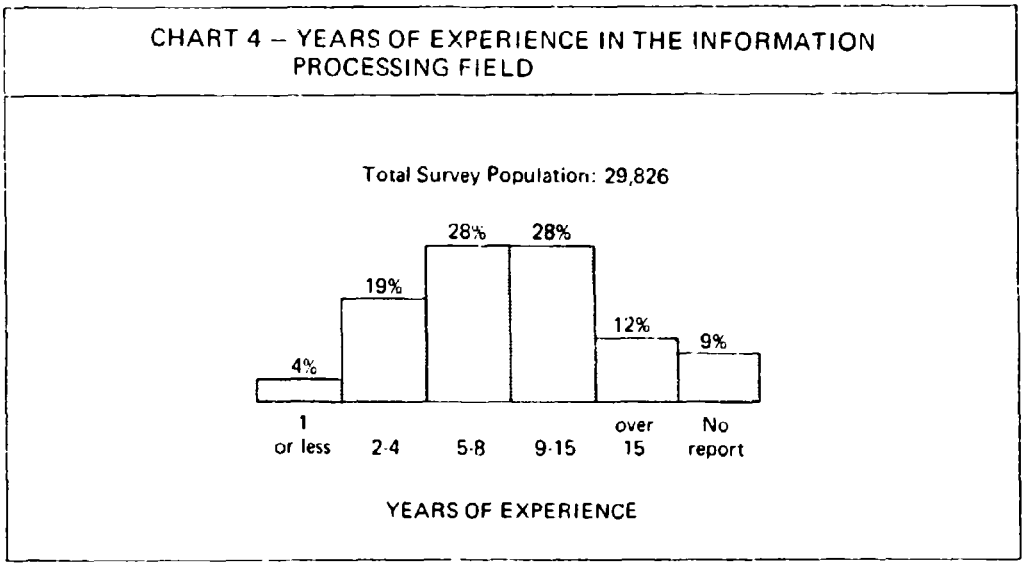
Total Number Responding:	24,332	
		Percent
Total Number of Mentions	26,706	100
Analog	1,463	5.5
Digital	23,574	88.0
Hybrid	1,669	6.5

2. *Experience in the Information Processing Field*

Number of years worked in the Information Processing Field (Question 9)

27,265 respondents answered this question, or 91.4% of the total population of 29,826. 2,561, or 8.6% did not respond. 4,894 respondents had indicated in Question 7 that their work was "*not* primarily concerned with computers or data processing." It would appear from the number of responses to this question that some of those whose jobs are not connected with computers regard themselves as having had experience in the field. The explanation could be either in the interpretation made of the "primarily", or that some individuals not currently working in the field did so at some other time. The median experience is about 8 years. The distribution is shown in Chart 4.

CHART 4 – YEARS OF EXPERIENCE IN THE INFORMATION PROCESSING FIELD



3. *Occupational Specialties*

The purpose of Question 10 was to determine the distribution of occupational specialties.

These were grouped in three broad categories defining the nature of the connection between the respondent's work and computers. If data processing systems (hardware, software, procedures, etc.) are thought of as tools, it was considered desirable to distinguish work that involves *building*, as contrasted to *using*, such tools. For respondents whose work involved neither, a third category was included to identify those with a strong professional interest in computers and data processing. The distribution of responses is shown in Chart 5, and is in very good agreement with the answers to Question 7, which asked respondents to indicate whether or not their work was primarily concerned with computers.

The occupational specialties listed in Question 10 have been combined into eight groups. Their distribution among the sub-population of respondents who regard their work as "directly involved" with computers and data processing, is shown in Chart 6. The distribution of areas of application of computers for the sub-population of users is shown in Chart 7.

CHART 5 – PRIMARY CONNECTION OF WORK WITH COMPUTERS AND DATA PROCESSING

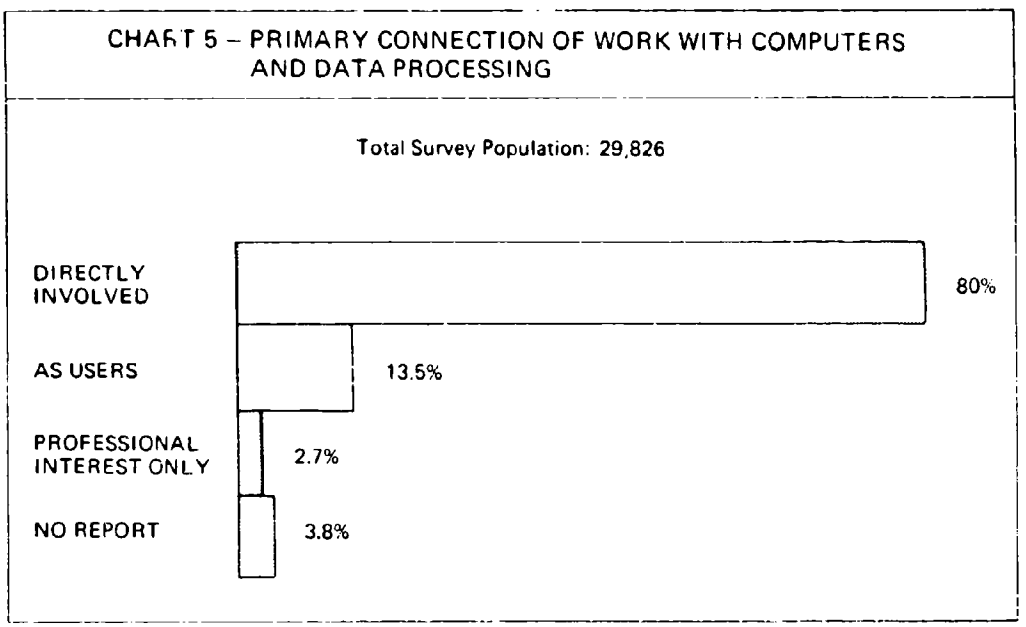


CHART 6 – OCCUPATIONAL SPECIALTIES OF BUILDERS OF COMPUTER AND DATA PROCESSING TOOLS

Total Survey Population: 29,826 (100%)
Sub-population : 23,677 (80%)

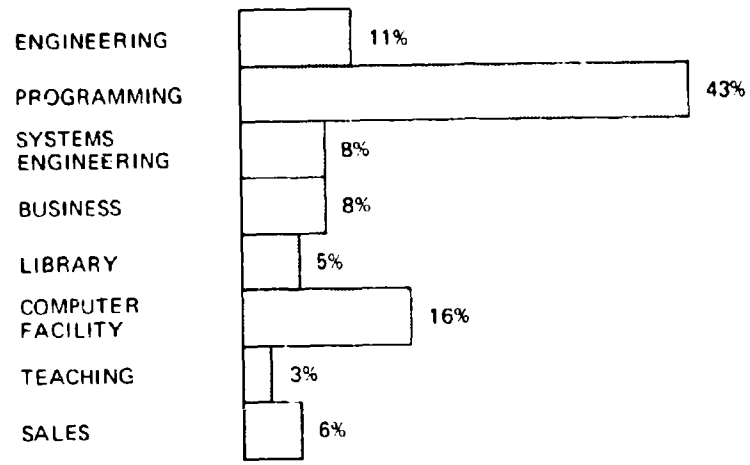
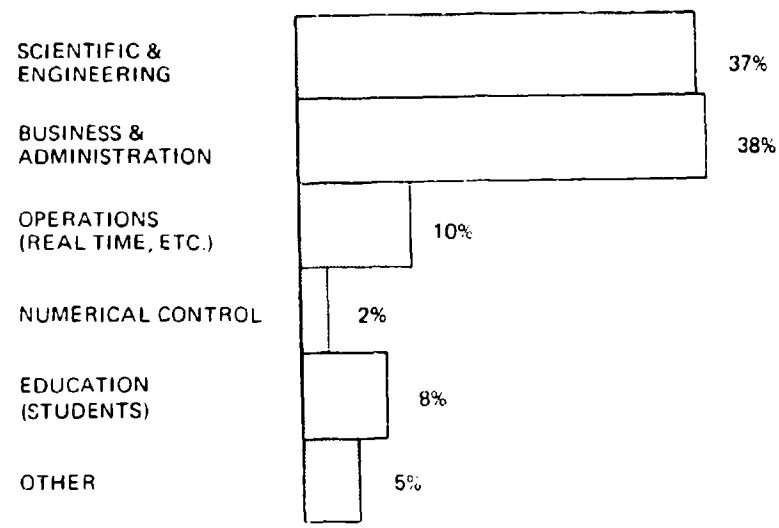


CHART 7 – AREAS OF APPLICATION OF USERS

Total Survey Population: 29, 826 (100%)
Sub-population : 4,305 (13.5%)



4. *Relation of Occupational Specialty to Discipline of Formal Education*

By combining the responses to Questions 5 and 10, a two-dimensional table is obtained. Each entry in the table gives a measure of the relation of the discipline of formal education (of respondents holding Associate degrees, or higher) and the occupational specialty in current employment. Results are shown in Table 2.

TABLE 2

Relation of Occupational Specialty to Discipline of Formal Education

Occupational Discipline / Specialty	Engineering	Programming	Systems Engr'ng	Business Systems	Library	Computer Facility	Teaching	Sales
Behavioral/Social Sciences	(2)* 26 (1)**	(38) 458 (6)	(7) 83 (5)	(16) 189 (16)	(8) 102 (9)	(15) 177 (12)	(4) 53 (10)	(9) 112 (11)
Education	(3) 15 (-)	(40) 204 (3)	(3) 19 (1)	(9) 45 (4)	(10) 51 (5)	(15) 79 (5)	(12) 64 (11)	(6) 28 (3)
Engineering	(34) 1910 (83)	(32) 1846 (25)	(18) 1010 (58)	(2) 137 (11)	(1) 93 (8)	(5) 298 (20)	(2) 136 (24)	(5) 289 (30)
Humanities	(2) 13 ( )	(34) 196 (3)	(6) 37 (2)	(11) 67 (6)	(22) 129 (11)	(9) 51 (3)	(3) 19 (3)	(10) 59 (6)
Information Processing Sciences	(3) 29 (1)	(44) 402 (5)	(4) 41 (2)	(6) 58 (5)	(28) 256 (23)	(6) 58 (4)	(4) 36 (6)	(3) 24 (3)
Mathematics	(3) 104 (4)	(70) 2808 (38)	(7) 265 (15)	(4) 158 (13)	(2) 78 (7)	(7) 292 (20)	(4) 157 (28)	(4) 155 (15)
Bio-Medical Sciences	(4) 6 (-)	(40) 66 (1)	(6) 11 ( )	(5) 9 ( )	(34) 58 (6)	(5) 9 ( )	(3) 5 (-)	(4) 6 (-)
Physical Sciences	(11) 147 (6)	(47) 609 (8)	(10) 127 (7)	(4) 47 (4)	(12) 157 (14)	(9) 105 (7)	(2) 33 (5)	(4) 53 (6)
Other	63 (3)	815 (10)	146 (8)	495 (41)	205 (18)	461 (30)	58 (10)	304 (30)

* Number in ( ) gives percentage of respondents with degree(s) in discipline (row) working in specialty (column)

** Number in ( ) gives percentage of respondents working in specialty (column) holding degree(s) in discipline (row)

5. *Type of Employer; Employment Milieu*

Type of Employer (Question 11)

29,061 respondents, or 97.4% of the total survey population, answered this question. Five broad categories of employer were listed in the questionnaire: Self-employed, Private Industry or Business, Educational Institutions, Federal government, and State or Municipal government. In the category "Private Industry", three sub-classes of enterprises directly associated with the field were singled out, with all other types grouped in a fourth category. The distribution is shown in Chart 8. (For a discussion of non-homogeneity in the total population with respect to employment-related questions, see Section V.)

CHART 8 – TYPE OF EMPLOYER

Total Survey Population: 29,826

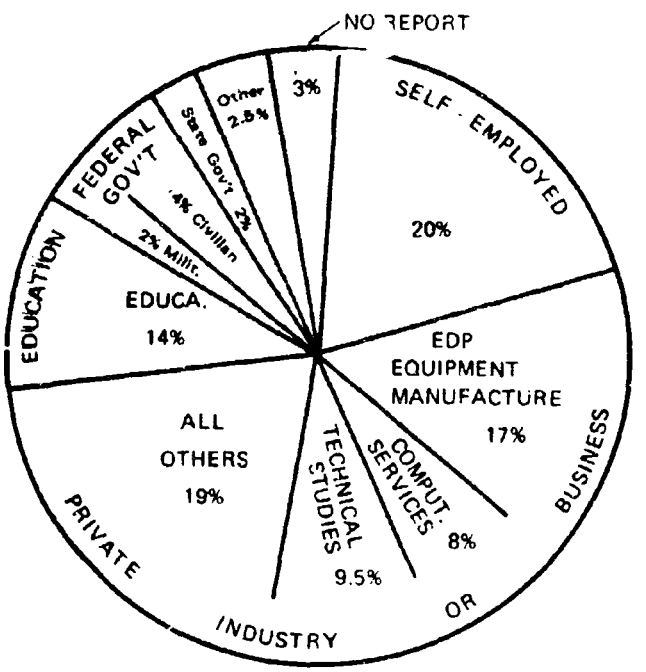
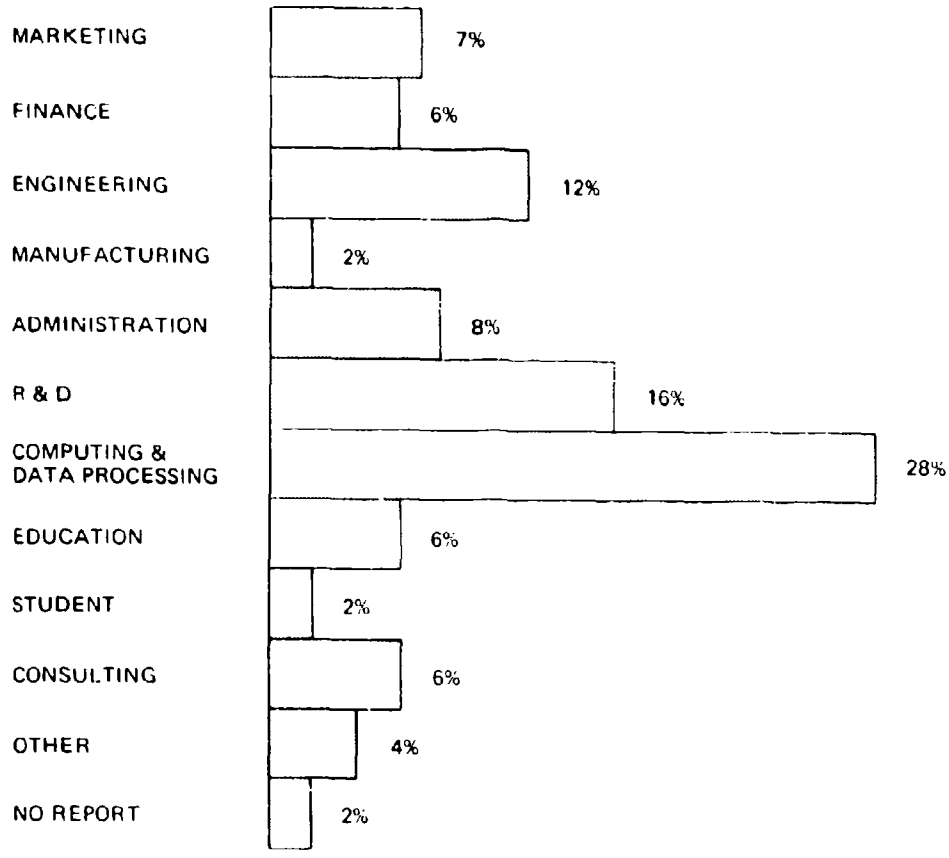
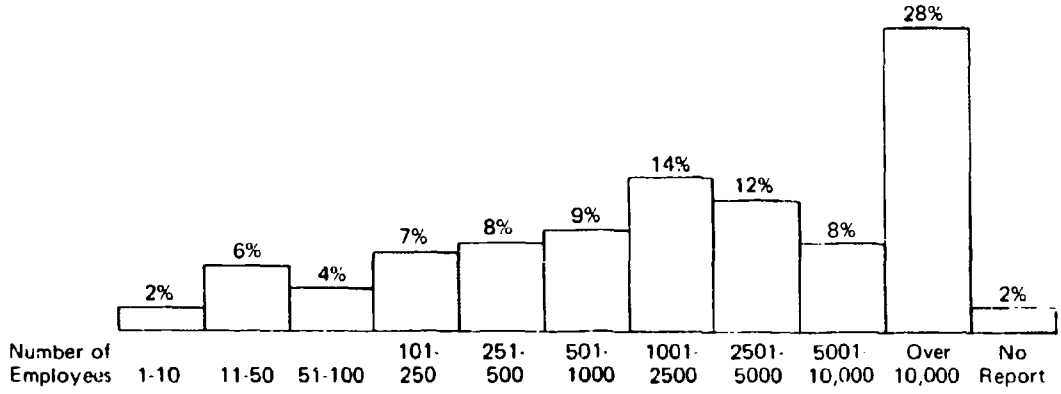


CHART 9 – ORGANIZATIONAL COMPONENT; SIZE OF EMPLOYER

Total Survey Population: 29,826



(A) – ORGANIZATIONAL COMPONENT WHERE EMPLOYED



(B) – SIZE OF EMPLOYER

Employment Milieu (Questions 12 and 13)

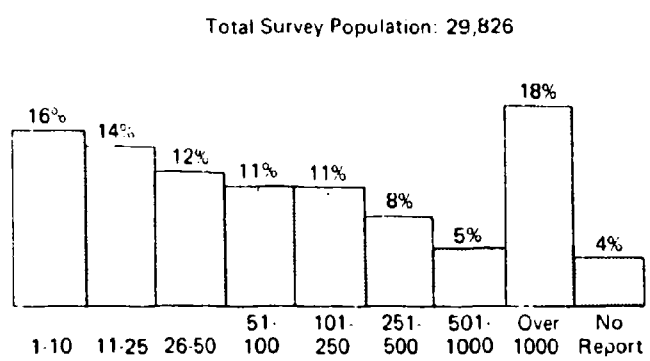
Respondents were asked to indicate the major component of the organization in which they work. Ten components were listed. One of the entries was Computing, Data Processing or Information Services, and respondents were asked not to check it, if such a component was organizationally subordinate to one of the other components of their employer's organization. The objective of this phrasing was to obtain an indication of the extent to which organizations, by according information processing the status of a major component, recognize the importance of this function to the entire organization. 28.4% of the respondents reported that they work in this component and that, in their organization, it was one of the major components. The distribution is shown in Chart 9 (A).

The distribution of size (number of employees) of employer is shown in Chart 9 (B).

6. *Number of Information Processing Personnel Working in Respondent's Organization*

Question 14 asked respondents to estimate the number of employees in their organization who are directly (emphasis in questionnaire) involved in information processing activities. From the number of responses received (95.6%), it is evident that the boldly-printed word "directly" was not, by itself, sufficient to evoke the desired association with the meaning used in Question 10, i.e., "directly involved" = builder of information processing tools. From Question 10, 80% of the total survey population reported being directly involved with information processing. The distribution of responses to Question 14 is shown in Chart 10.

CHART 10 – DISTRIBUTION OF INFORMATION PROCESSING PERSONNEL IN RESPONDENTS' ORGANIZATIONS



7. *Mobility*

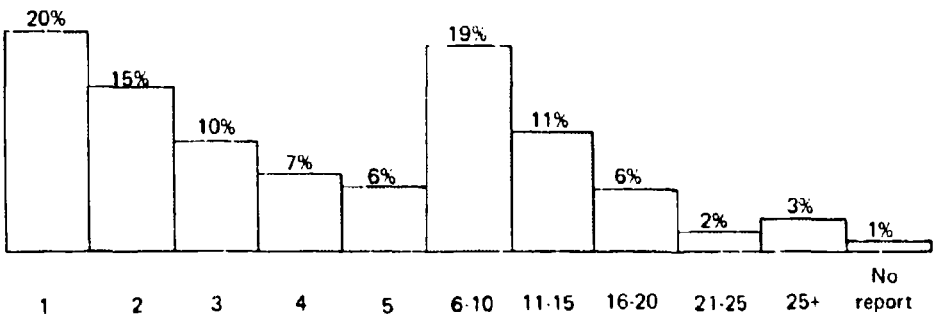
Two questions (15 and 16) endeavored to obtain measures of mobility within the profession. The first asked respondents to indicate the length of their service in their present organization. 99.1% answered the question. See Chart 11 (A).

In the second question, respondents were asked to report the number of organizations worked for full time since entering the Information Processing field. 91% answered this question. The distribution is shown in Chart 11 (B).

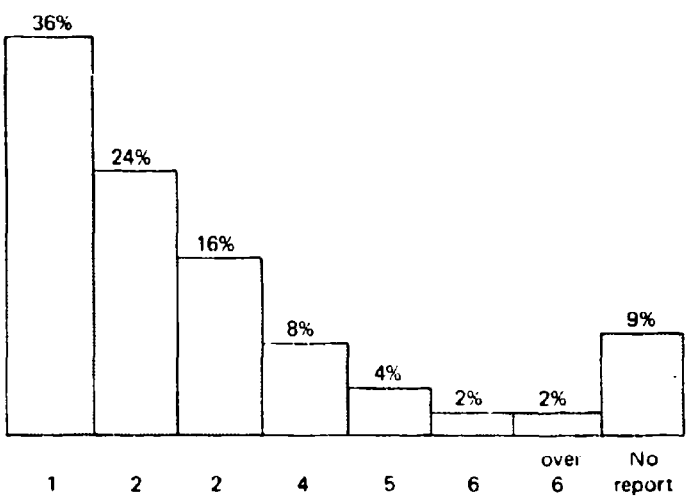
Table 3 shows the relationship between years of experience in the Information Processing field and number of employers worked for, as derived by combining responses from Questions 9 and 16.

CHART 11 -- MOBILITY

Total Survey Population: 29,826



(A) – NUMBER OF YEARS WITH PRESENT ORGANIZATION



(B) – NUMBER OF EMPLOYERS WORKED FOR SINCE ENTERING INFORMATION PROCESSING FIELD

TABLE 3

Years of Experience by Number of
Employers Worked for Full Time

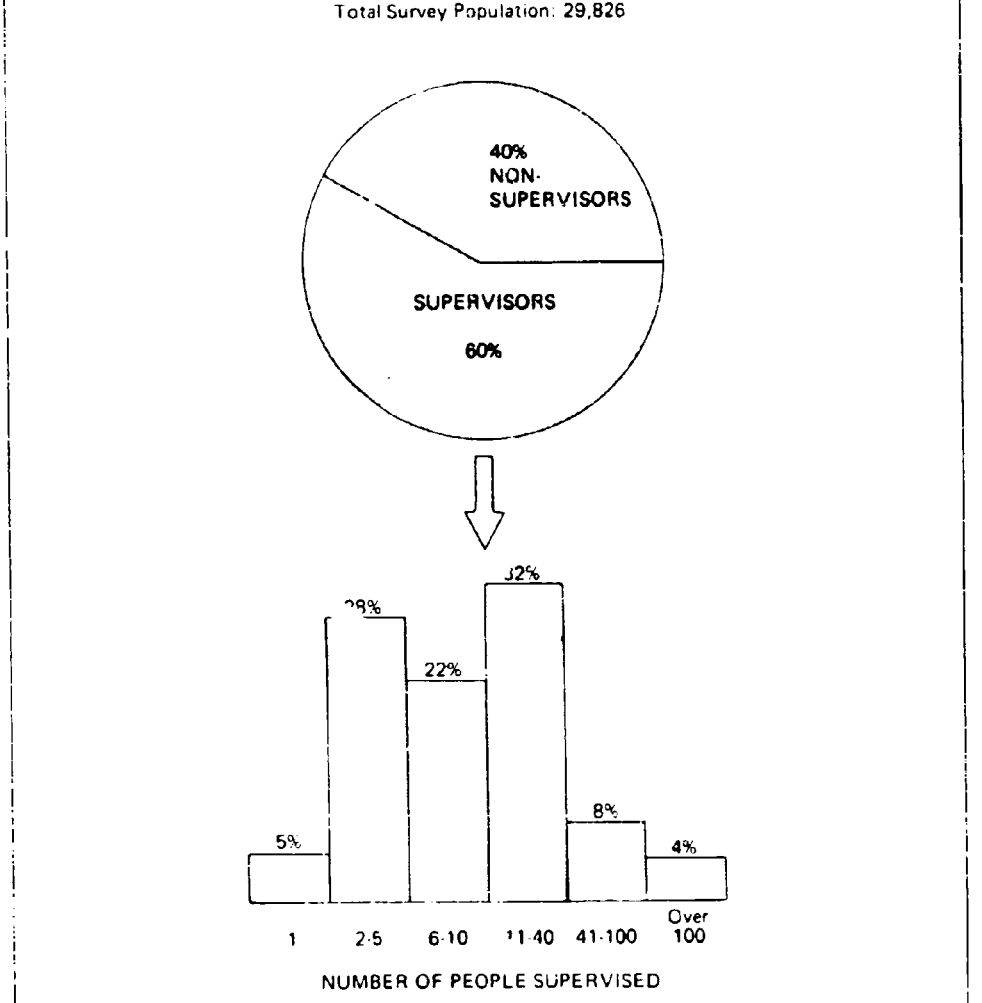
Experience	Total	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten	Over Ten	No Answer
	29826	10629	7173	4686	2306	1096	498	240	111	59	51	233	2744
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Under 1	636	478	56	7	3	3	–		–	1	–	–	
	2%	4%	1%	*	*	*							
1 Year	725	558	83	18	4	–	2	1	–	1	–	3	
	2%	5%	1%	*	*	–	*	*	–	*	–	*	
2 Years	1661	1072	356	72	13	5	–	–	1	–	–	3	
	6%	10%	5%	2%	1%	*	–	–	*	–	–	*	
3 Years	1990	1020	627	188	39	7	1	1	1	–	1	5	
	7%	10%	9%	4%	2%	1%	*	*	*	–	*	*	
4 Years	1968	843	657	261	98	12	6	1	1	–	–	2	
	7%	8%	9%	6%	4%	1%	1%	*	1%	–	–	*	
5 Years	2254	883	710	367	117	48	7	6	–	1	–	4	
	8%	8%	10%	8%	5%	4%	1%	3%	–	*	–	*	
6 Years	2135	749	689	389	141	38	30	3	–	–	–	3	
	7%	7%	10%	8%	6%	3%	6%	1%		–	–	*	
7 to 8	3830	1175	1096	836	352	139	49	29	16		1	4	
	13%	11%	15%	18%	15%	13%	10%	12%	14%	–	*	*	
9 to 10	3374	1028	844	688	361	187	70	20	13	16	14	14	
	11%	10%	12%	15%	16%	17%	14%	8%	12%	27%	27%	6%	
11 to 15	4995	1289	1120	1073	649	320	151	68	18	12	9	73	
	16%	12%	15%	23%	28%	29%	30%	28%	16%	20%	18%	31%	
Over 15	3697	837	692	678	489	319	176	108	57	25	22	115	
	12%	8%	10%	14%	21%	30%	37%	47%	51%	42%	43%	50%	
No Answer	2561												
	9%												

8. Responsibility

17,942 respondents reported in Question 17 that they were listed in their employer's organization chart as holding a supervisory position. (The number of non-supervisory personnel is assumed to be the difference between the total survey population and the number of responses to Question 17.)

The distribution of the number of people supervised by those reporting as being supervisors is shown in Chart 12.

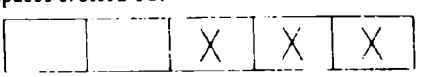
CHART 12 -- DISTRIBUTION OF SUPERVISORY AND NON-SUPERVISORY PERSONNEL, NUMBER OF PEOPLE SUPERVISED



9. Geographic Distribution

The geographic distribution by work location of information processing personnel covered by the survey is depicted in Chart 13.

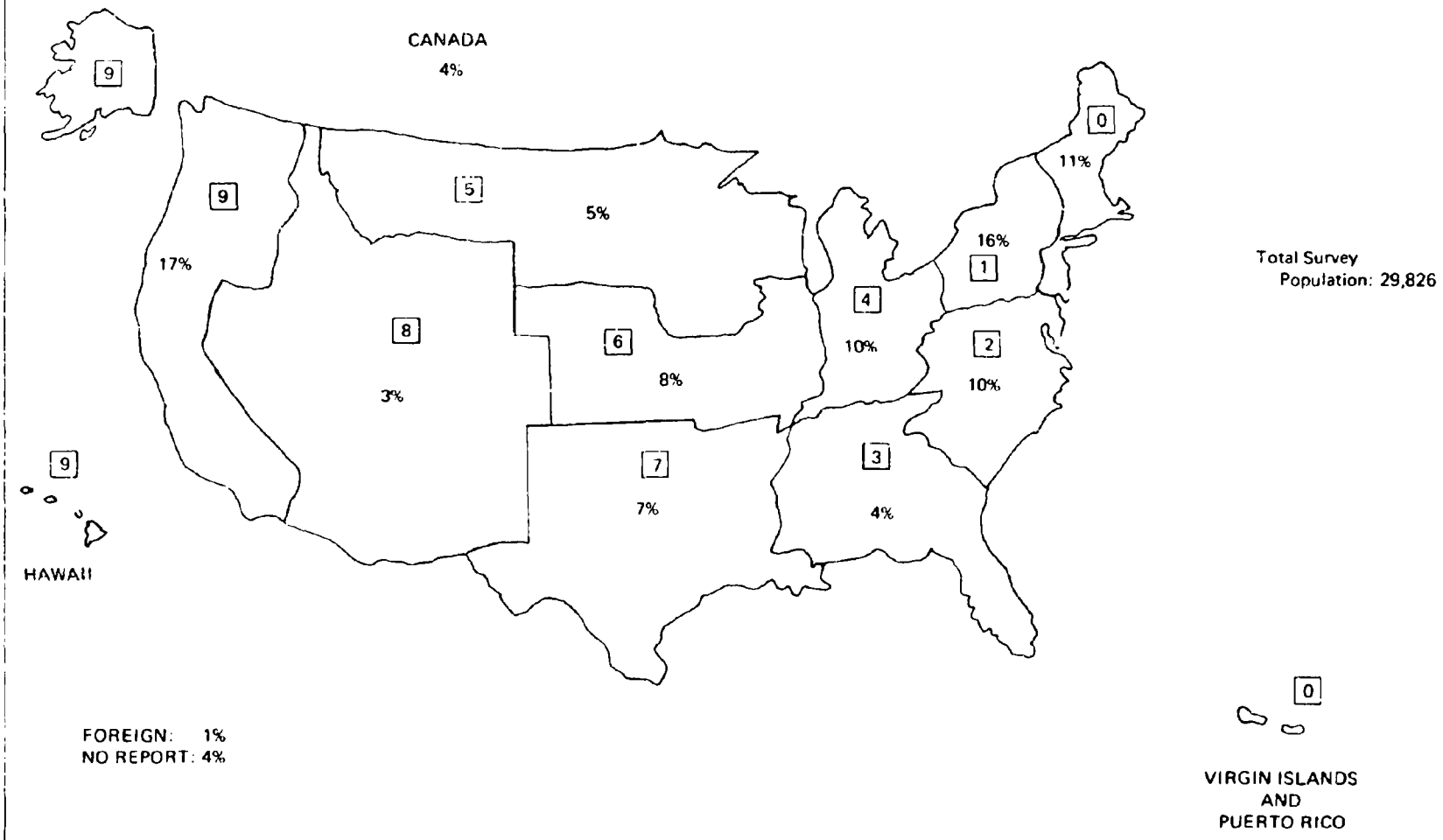
Distribution for the U.S. is by Zip Code area. Due to a last-minute proofread ng error, the questionnaires were printed with space for a full 5-digit Zip Code, instead of the intended "first-two-digits" format - last three digit spaces crossed out:



In keypunching, only the first two digits of the Zip Code were recorded. 4% of the respondents listed Canada, and 1% a foreign country, as their work location. 4.6% did not answer this question.

CHART 13 – GEOGRAPHIC DISTRIBUTION

(ZIP CODE AREAS)



Total Survey
Population: 29,826

FOREIGN: 1%
NO REPORT: 4%

D. PROFESSIONAL ACTIVITIES

1. Holders of Professional Licenses and Certificates

Respondents were asked (Question 24) whether they were licensed or held professional certificates. 18% stated that they were licensed or certified, 73% reported that they were not, and 9% did not answer the question. The distribution is shown in Chart 14.

2. Membership in Societies Participating in Survey

The purpose of this question was to determine the magnitude of membership overlap between the participating societies. One of the reasons for doing a "complete coverage" survey instead of a sample was that the overlap between societies was not known, and a representative distribution of samples could not be determined *a priori*. The matrix of Table 4 shows the pair-wise overlap between the societies. (Multiple memberships of degree higher than 2 were not analyzed for the purposes of this report. However, the raw data are available in machine-readable form, and the information could be extracted from these data.)

3. Membership in Other Professional Societies

Respondents were asked (Question 26) to list membership in professional societies other than those participating in the survey. About 40% of the respondents reported belonging to one or more such societies. 52% to none and 8% did not answer the question. The distribution is shown in Chart 15.

TABLE 4

Pair-Wise Membership Overlap Between Societies

Participating Society	Total Mentions	Participating Society							
		ACM	ACL	ASIS (ADI)	DPMA	IEEE	NCS	SCI	SLA
ACM	12,032	12,032 (100)*	92 (85)	280 (21)	715 (6.5)	1,583 (27)	26 (5)	163 (18.5)	50 (3)
ACL**	108	92 (1)	108 (100)	37 (3)	2 (-)	18 (-)	2 (-)	1 (-)	3 ( )
ASIS (ADI)	1,306	280 (2)	37 (34)	1,306 (100)	25 (-)	62 (-)	2 ( )	9 (-)	576 (30)
DPMA	11,009	715 (6)	2 (2)	25 (2)	11,009 (100)	87 (1.5)	16 (3)	13 (1.5)	13 (-)
IEEE-CG	5,879	1,583 (13)	18 (17)	62 (5)	87 (1)	5,879 (100)	18 (4)	277 (31)	19 (1)
NCS	480	26 (-)	2 (2)	2 (-)	16 (-)	18 (-)	480 (100)	4 (-)	2 (-)
SCI	882	163 (1.5)	1 (1)	9 (-)	13 (-)	277 (5)	4 (-)	882 (100)	8 (-)
SLA	1,925	50 (-)	3 (3)	576 (44)	13 (-)	19 (-)	2 ( )	8 (1)	1,925 (100)

*Figures in parenthesis are the percentages of members of the society in the specified column who report membership also in the society in the specified row.

**Data for ACL derived from respondents who are members of other societies.

CHART 14 – LICENSED OR CERTIFICATED INFORMATION PROCESSING PERSONNEL

Total Survey Population: 29,826

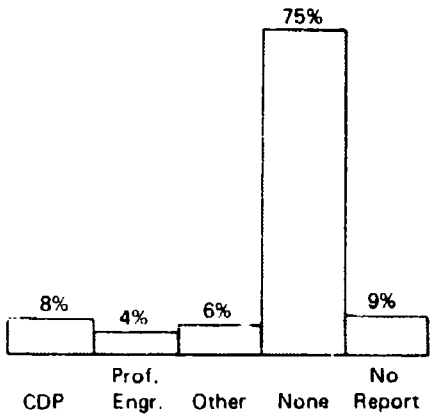
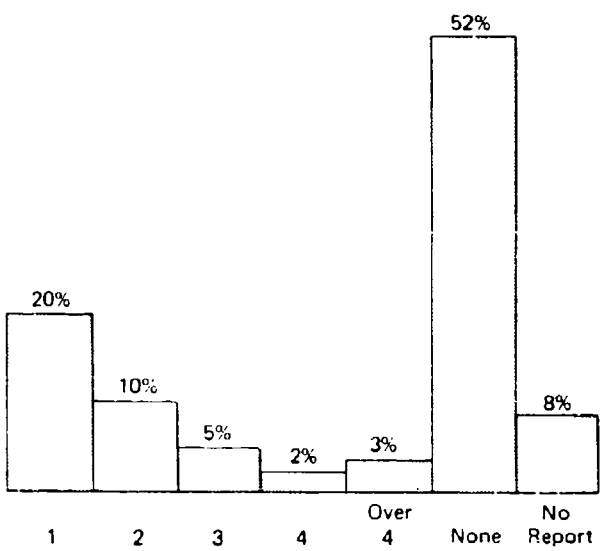


CHART 15 – MEMBERSHIP IN OTHER SOCIETIES

Total Survey Population: 29,826



E. SALARY AND INCOME

Salary and income data are presented in the form of plots of (Annual Salary) vs. (Years since B.S.), (Annual Salary) vs. (Years in EDP Field), and (Annual Salary) vs. (Age), for various cross-sections of the Information Processing profession. The cross-sections were selected to facilitate comparisons with other national and regional salary surveys of professional personnel and to provide a view of the professional salary make-up from as many points of view as possible. No attempt is made to interpret the findings, since there is usually varied opinion as to why some plots behave as they do and why some comparisons are not what an individual analyst would initially suspect. When using the salary curves, it should be kept in mind that some of the breakdowns yield very small sample sizes. In general, data should be viewed with a degree of confidence proportional to the sample size. Curves with very small sample sizes are shown as dotted curves to remind the reader of their questionable validity. Sample sizes are shown below each graph in tabular form for each value of the abscissa.

The raw data were first separated into the different percentiles for each value of the abscissa, (Years since B.S.) in most cases. For instance, the 90th percentile salary for a particular value of (Year since B.S.), say X, means that 90% of all respondents who received their B.S. X years ago earn that salary or less. Since salary was reported in intervals of from $1,000 to $5,000, it was assumed for convenience that a uniform distribution existed throughout each interval. A minimum salary of $4,000 and a maximum salary of $60,000 were assumed, to eliminate the open intervals at each end of the salary scale. In cases where fewer than 10 people exist at a particular number of (Years since B.S.) the percentile is based on a fractional number of people with appropriate weighting for smoothing.

After separation on the basis of percentile, the raw data were then smoothed using a weighted least-squares smoothing algorithm. This algorithm fits the raw percentile data to a second degree polynomial, with weighting based upon the number of people in the sample used to calculate the percentiles.

After comparing different data smoothing techniques, it was decided that the weighted second degree polynomial fit yielded the best results consistent with the following criteria:

1. The curves should be smooth and present an orderly relationship between salary and experience;
2. Salary curves should start low for little experience, grow rapidly at first and then level off at higher levels of experience;
3. The different percentile curves should diverge from one another as experience level increases, i.e., outstanding employees grow more rapidly than poorer ones;
4. The curves should fit reasonably to the raw data, with the closeness of fit improving as sample sizes get larger.

In some instances respondents did not answer all questions. As a result, cross-checks of sample sizes do not always compare exactly. Graph 1 shows a total sample size of 19,986, while the total of Graphs 6 through 11 is 19,048. The principal difference is that Graph 1 includes all Canadian and foreign, while the other graphs do not.

Graph 1 is a plot of (Salary) vs. (Years since B.S.) for all respondents with degrees. The mix relative to highest degree on this curve set is as follows:

10% PhD as highest
36% MS as highest
54% BS as highest

The mix relative to supervisory/non-supervisory status is 55% supervisors and 45% non-supervisors.

With these mixes in mind the reader can make appropriate comparisons with the more specific cross-sections included in this report or with other national and regional surveys.

Graphs 2, 3, 4, and 5 are presented to indicate (Salary) vs. (Experience) comparisons relative to the major categories of organizations listed in Question 11 of the questionnaire--SELF EMPLOYED, PRIVATE INDUSTRY OR BUSINESS, EDUCATIONAL INSTITUTIONS, and GOVERNMENT. These curves are for degreed people only, and no attempt was made to break down these categories as to degrees or supervisory status.

Graphs 6, 7, 8, 9, 10, and 11 are breakdowns of all degreed respondents relative to highest degree and supervisory status. These curves enable the reader to compare the supervisors with non-supervisors for any given degree, and to compare PhD's, Masters, and Bachelors for either supervisors or non-supervisors. These curves also furnish "norms" for the more detailed breakdowns.

Graph 12 shows a comparison of all supervisory personnel relative to the number of people supervised. Only the 50th percentile curves are used to indicate differences.

Graphs 13 through 23 are plots of (Salary) vs. (Years since B.S.) for all degreed people in the different Zip Code areas. This enables the reader to compare one geographic location with another or to compare a particular location with the total population (Graph 1). To further facilitate comparisons, the following breakdown of degrees within each Zip Code area is given:

DEGREED PEOPLE ONLY

Zip Code Area	PhDs	MS/MA	BS/BA	Total Degreed People
0	12%	42%	46%	2489
1	11	39	50	3391
2	10	34	56	2078
3	9	30	61	798
4	11	35	54	1689
5	9	28	63	898
6	10	34	56	1406
7	9	26	65	1214
8	13	31	56	627
9	9	37	54	3812
Canada	Not tabulated			1047

Graphs 24 through 32 are plots of (Salary) vs (Years since B.S.) for the degreed people only with breakdown as to field of highest degree. No attempt was made to further separate as to supervisor/non-supervisor status. The following distribution of degrees within each field is included to facilitate comparison between fields, and with other curves.

DEGREED PEOPLE ONLY

Field of Highest Degree	Ph.D.	M.S.	B.S.	Total Degreed People
Social Sciences	13%	25%	62%	1423
Education	6	41	53	643
Engineering	11	38	51	6334
Humanities	4	25	71	769
Information Processing Science	9	75	16	1129
Mathematics including Statistics	10	32	58	4526
Biomedical Sciences	36	23	41	254
Physical Sciences	21	25	54	1669
Other Fields	4	35	61	3206

Graph 28 is of particular interest because it deals with degrees in the Information Processing Sciences. Only in the last 4 or 5 years have universities offered degrees in this specific discipline. Nevertheless, in Graph 28, (Years since B.S.) ranges over the entire 30 year period. The sample contains individuals who, some time ago, received their B.S. degrees in other disciplines and returned to school to obtain a degree in Information Processing Sciences. This is further substantiated by the exceptionally high percentage of M.S. degrees in this particular discipline. Even though 75% of the members who made up this category have M.S. degrees, the salary levels beyond 5 years since B.S. are lower than those in any other discipline. The reader can speculate about people being replaced in their jobs by computers and being forced to change fields later in life; or he can conjecture any other reasonable explanation for this pattern.

Graphs 33 and 34 are plots of (Salary) vs. (Years in the EDP Field) for the two broad categories of Degreed and Non-Degreed people.

Graphs 35 through 40 are plots of (Salary) vs. (Age), with breakdowns according to educational level, i.e., no college, college but less than 99 units, greater than 100 units or A.A. degree, B.S. as highest, M.S. as highest, PhD as highest. These curves are presented to facilitate comparison with other national and regional surveys using Age as the independent variable. Also, these curves enable comparison of degreed people with non-degreed people using the common independent variable, Age.

Graphs 41 through 49 are breakdowns of degreed people into occupational specialties. The occupational specialties are then broken down further into supervisory/non-supervisory categories and still further into educational levels (PhD, M.S., B.S.). In an effort to limit the curves to reasonable numbers and to keep the sample sizes to an acceptable level, some of the primary occupational specialties of Question 10 in the questionnaire were combined. The combinations were made on the basis of similarity of specialty after careful inspection for consistency of the data.

Under the major heading of ENGINEERING of Question 10 the first two categories (Circuit, Component and Logic Design, and Computer Architecture) were combined under the heading of COMPUTER DESIGN. Graphs 41A through F are the result of the COMPUTER DESIGN category for degreed people only, with appropriate breakdown as to supervisory status and educational level.

From the Major Category PROGRAMMING (Question 10) two sub-categories were assembled. The first is called APPLICATIONS PROGRAMMER and is a combination of Scientific and Engineering Applications, Business Applications, and Numerical Control. The results for this combined category are shown in Graphs 42A through F. The second programming category is called SYSTEMS PROGRAMMING/RESEARCH and is a combination of Systems Programming, Programming Languages and/or Translators, Artificial Intelligence, and Research. The results of this combined category are shown in Graphs 43 A through F.

The major category of SYSTEMS ENGINEERING/DESIGN had no sub-categories. The results of this classification are presented in curves 44 A through F.

No combinations were made with the category of BUSINESS SYSTEMS AND PROCEDURES ANALYSIS. Since the sample sizes for PhD's were extremely small, M.S. and B.S. degrees only are presented. Only the 50th percentile curves are shown. The results of this classification are presented in curves 45 A and B.

The entire category of LANGUAGE DATA PROCESSING was elimated because the AMTCL did not mail out their questionnaires. As a result, the frequency distribution on these data indicated virtually zero response.

The category of LIBRARY AND INFORMATION RETRIEVAL is presented in Graphs 46 A, B and C. Because of the small sample sizes, only the 50th percentile curves are used.

In the major category of COMPUTER AND/OR EAM OPERATIONS only the sub-category of FACILITY MANAGEMENT is presented. The response to the other two sub-categories was too small to be meaningful. Since FACILITY MANAGEMENT is primarily a Supervisory category (58 non-supervisors, out of a total of 3,446 checked this category) only supervisors are presented. The results are shown in Graphs 47 A, B, and C.

The major category of INSTRUCTION/TRAINING was not broken down into its sub-categories, but is presented as a combined group. Because of small sample sizes, only the 50th percentile curves are shown. The results of this category are shown in Graphs 48 A, B, and C.

The 50 percentile curves for SALES AND/OR MARKETING personnel are shown in Graphs 49 A and 49B. PhD's have been excluded because of small response.

The response to Question 23 (Additional Income from Non-Primary Occupation) is shown in Table 5. Three major category columns are used to show a more detailed breakdown of Academic Self-Employed, and other groups.

The response to Question 20 (Working Days of Paid Vacation Received each Year) is shown in the Table below. The percentages are percentages of the people who answered the question--not the total population.

Working Days of Paid Vacation	Number of People	% of Total
Less than 5	1,062	4 %
5 to 10	10,876	37.5%
11 to 15	8,689	30 %
15 to 20	4,441	15 %
Over 20	3,916	13.5%

TABLE 5

Amount of Additional Income vs. Profession
USA Citizens Only

$/Year	Number of Academics	Number Self-Employed	Other	Total
Under 100	1301	1558	6046	8905
100-499	413	606	1843	2862
500-999	251	523	1486	2260
1,000-1,499	298	505	1464	2267
1,500-1,999	175	291	722	1188
2,000-2,999	243	316	956	1515
3,000-3,999	177	160	532	869
4,000-4,999	109	73	250	432
5,000 5,999	88	80	226	394
6,000-6,999	43	27	110	180
7,000-7,999	28	21	71	120
8,000-8,999	25	18	66	109
9,000-9,999	11	6	22	39
10,000-11,999	34	48	96	178
12,000-13,999	16	7	40	63
14,000-17,999	18	16	47	81
18,000-25,999	10	13	49	72
26,000-Over	5	17	34	56
Totals	3245	4285	14060	21590

V. DISCUSSION

A. HOW REPRESENTATIVE IS THE INFORMATION PROCESSING PERSONNEL SURVEY?

There are two aspects to this question: (1) how representative of the total population engaged in information processing activities is the population represented by the societies? (2) how representative are the ensemble findings presented in this report with respect to arbitrarily small samples taken from the opoulation covered by the survey?

1. As mentioned briefly in the introduction to this report, no authoritative quantitative personnel data such as levels and growth of employment exist for the field. The reasons most frequently given for this are: lack of standard definitions of occupational specialties; the explosive growth of the field and the continuous state of change prevailing; the entry into the field of individuals, or entire organizations, from other established fields (e.g., electronics) who continue to be identified with these fields rather than information processing, etc.

Qualitatively, it is possible to point out in what respects the survey is and is not representative of the whole population associated with the field.

Fundamentally, the question becomes to what extent the societies participating in this survey, viewed as a whole, attract members from all the known occupational categories in the field.

The qualifications for membership vary substantially accross the participating societies. Some societies require demonstration of "professional status"--a not-too-precise combination of formal education and experience; for some societies an indication of interest in the field (and ability to pay dues) is deemed sufficient qualification.

The broad occupational specialties included in the questionnaire encompass most of the known and accepted generic categories of employment in information processing. The returns from the survey give non-trivial yields for these broad categories. However, within some of these categories, the yields are uneven. For example, in the major category, COMPUTER AND/OR EAM OPERATIONS, only the FACILITY MANAGEMENT sub-category yielded a significant sample. Thus, this survey cannot be said to be representative of the large number of workers holding jobs such as keypunch, tape, and tabulating equipment operators and other support personnel employed in computer and data processing facilities. Similarly, the low percentage of responses for the sub-categories MANUFACTURING and FIELD ENGINEERING indicates that manufacturing and production technicians are lightly represented in the survey.

In summary, the results of this survey confirm what could have been originally surmised, but not proven withcertainty. That is, that the membership of the societies participating in the survey is made up predominantly of professional personnel. Skilled white- or blue-collar workers employed in all areas of information processing represent a very small (less than 5%) segment of that membership.

2. A comparison between the *a priori* distribution of the membership in the participating societies and the distribution of the membership from the returns shows a very good agreement between the two. In that respect, the results of the survey reflect quite well the constituent characteristics of the entire population. However, when responses from members of one society to a specific question are compared to those of other scoieties, or to the entire population, there are significant variances at times between the distributions. In other words, the population surveyed is not homogeneous. As noted earlier the raw data from their membership has been made available to all the participating societies.

B. TRENDS: COMPARISONS WITH OTHER SURVEYS

The questionnaire used in this survey contained no explicit questions designed to obtain trend data. The reasons for this are easy to understand: Questions that tax the respondent's memory tend either not to be answered at all or, if answered, produce unreliable data.

In a field that is changing as rapidly as Information Processing, obtaining some indices of the changes that are taking place is perhaps as significant as getting a comprehensive snapshot of the situation as it exists at one instant of time. This point can be illustrated only partially at this time, since a survey that is fully comparable in coverage with this one has not been made before.

TABLE 6

Comparison of Some Findings of the 1960 PGEC and the 1968 Information Processing Personnel Surveys

Characteristic	1960 PGEC	1968 Members with Engin. Degrees	1968 Entire Population
AGE			
Median	33-36 years		34 years
EDUCATION			
(Highest Degree)			
None & Assoc. Arts	6%		31.5%
B.S.	51%	53%	37%
M.S.	34%	38%	24%
Ph.D.	9%	11%	7.5%
EMPLOYMENT			
Experience (Median)	8-9 years		8 years
Nature of Employer			
Self-Emp. & Private Ind.	86%		74%
Government	6%		8%
Education	7%		14%
Responsibility			
Supervisors	59%		60%
Non-Supervisors	41%		40%
Occupational Specialty			
	Engineering 58%	Engineering 34%	
		Systems Eng. 18%	
	Programming 4%	Programming 32%	
	Research 15%		
	Education 3%	Teaching 2%	
	Sales 2%	Sales 5%	
	Administr. 10%		
	Production 1%		
	Other 4%	Other 8%	

The questionnaire used in the survey conducted in 1960 by the Professional Group on Electronic Computers of the IRE* included a number of questions that are almost identical to questions asked in this survey. A comparison of the findings for these questions from the two surveys is shown on Table 6. The findings are in reasonably good agreement with the exception of the results for Nature of Work (PGEC, 1960) and Occupational Specialty (Information Processing Personnel Survey, 1968). In this case there appears to be a marked increase in the number of individuals with engineering degrees who report programming as their primary occupational specialty. The 1960 PGEC Survey did not derive data on distribution of degrees by discipline. In their 1958 survey that question was asked and the finding was that over 96% of the members had degrees in ENGINEERING. In this 1968 survey the two societies whose members have predominantly an engineering education are IEEE-CG and SCI. The overlap of membership between the two societies is quite strong: 31.4% of SCI members belong to the IEEE CG. The data shown in Table 6 are for all respondents with ENGINEERING degrees. The comparisons are believed to be valid. Although the specialty sub-categories in the two questionnaires are not identical, the change alluded to cannot be explained entirely by the difference in the two questionnaires and populations surveyed. The most plausible explanation seems to be that the indicated change has actually occurred.

The importance of obtaining authoritative information of this type for the professional societies and segments of the society at large is apparent. The individuals who worked directly in conducting this survey are convinced, in spite of the many frustrations and problems encountered in this initial effort, that such surveys should be repeated periodically as a basic function of the societies in the field.

* K. W. Uncapher, "1960 PGEC Membership Report," IRE Transactions on Electronic Computers, vol. 10, pp. 81-90, March, 1961.

APPENDIX A

List of Participants in Working Committee of
The Information Processing Personnel Survey

Member	*Society Represented*
H. G. Asmus	AFIPS
Wade Cole	ACM
Charles L. Davis	DPMA
Malcolm R. Davis	IEEE - CG
R. Calvin Elliott	DPMA
Jerome W. Geckle	DPMA
J. Don Madden	ACM
I. D. Nehama (Chairman)	IEEE - CG
Simon Newman	ADI
Arthur I. Rubin	SCI

ACKNOWLEDGEMENTS

The committee received valuable help in all phases of its activities from various individual members of the participating societies. The committee wishes to gratefully acknowledge the contributions made by all those who took an interest in its work.

Special mention is due to:

Mr. P. Armer (AFIPS)	Prof. A. G. Oettinger (ACM)
Mr. R. A. Dickmann (ACM)	Mrs. R. Swanson (AFOSR)
Dr. B. Gilchrist (AFIPS)	Mr. R. W. Taylor (ARPA)
Dr. H. R. J. Grosch (NBS)	Mr. K. W. Uncapher (IEEE)

The committee also acknowledges the encouragement provided by Robert B. Forest, Editor of Datamation.

APPENDIX B
DESIGN OF THE QUESTIONNAIRE

A critical examination of the questionnaire used in this Information Processing Personnel Survey is necessary for two reasons: (a) to determine whether the design of the questionnaire (format, phrasing and content of the questions) has affected the validity of the results; and (b) to identify those sections of the questionnaire which should be improved, if similar surveys are undertaken in the future. This examination is based primarily on information from two sources: (a) the distributions of the actual responses, some of which provide implicitly, some strong clues about the lack of clarity in the phrasing of, or adequacy of choice provided in, certain questions; (b) specific comments made by some respondents in letters or on the margins of the questionnaire.

GENERAL REMARKS – OVERALL QUESTIONNAIRE

Quality. Leaving aside the question as to the content of some of the questions, a number of compositional errors in printing appeared in the production run. Except for the failure to cross out the last three digits of the Zip Code (already noted in the body of the report), all these errors were in not properly indenting sub-categories according to the desired hierarchical order. These errors can be seen in the sample questionnaire included at the end of this appendix. Checking the responses to the questions containing these errors, it appears that the vast majority of respondents detected them and made allowances for them–scoring positions (boxes) for indicating choices were placed correctly

Format. A number of respondents remarked that there was overlap between some questions, and such redundancy required unnecessary additional effort on the part of respondents in filling out the questionnaire. For example, Questions 5 and 6 (EDUCATION) could have been combined. Instead of the check boxes in Question 5, blanks could have been inserted and respondents asked, as in Question 6, to indicate the year they had received their degree(s). The remark is well taken and the suggested format had occurred to the questionnaire designers. However it was thought desirable to obtain information on major subject in which degree(s) was earned, which required a question separate from Question 5. (This data on major subjects is available on magnetic tapes.)

Whenever it was possible to arrange a given question either as "multiple choice" or with blanks to be filled in, the designers chose the first alternative. The main reason for this was to minimize the cost of coding and keypunching and keep over-all costs within the allocated budget. In some instances, this objective was contrary to that of simplifying the task of filling out the questionnaire.

DETAILED REMARKS – SPECIFIC QUESTIONS

Education

The distribution of disciplines by Highest Degree (Chart 3) shows for the category "OTHER":

Associate of Arts	21%	(of 1,555)
Bachelor	12%	(of 20,865)
Master	14%	(of 9,402)
Ph D.	5.5%	(of 2,256)

These are high percentages, which would seem to indicate that the list of disciplines did not have adequate detail.

If Question 5 and 6 are combined, as discussed in the previous section, the list of disciplines can be expanded using the information of Major Subjects.

Employment

1. Questions 7 and 10 are redundant, i.e., the information asked for in Question 7 can be derived from the responses to Question 10. This information is important primarily to the societies -it gives an indication of the gross composition of their membership with respect to the population of workers in the field of information processing or outside it.

The over-all response to Question 10 was good (96.2%, in spite of its severe flaws in phrasing (see below). It seems safe to assume that, in the future survey, the response would be high to a question similar to Question 10. Then Question 7 could be deleted.

2. Question 10 was the longest, most complex question in the questionnaire. First, the data from indications of a PRIMARY and a SECONDARY interest for each occupational specialty turn out to be difficult to interpret when no quantitative information is given, e.g., what fraction of the time is spent in the primary and secondary area? Such breakdown could be deleted with no loss of useful information.

Some respondents have remarked that the list of specialties (and sub-categories within these specialties) contains some areas that are very sparsely populated -several respondents termed them as "esoteric." The principle guideline followed by the designers was to include at least all of the specialties of the dominant majority of the members of each society without regard to the portion of the whole population working in it.

Other respondents commented that the list of occupational specialties was not detailed enough, or that more information concerning each specialty would be useful, e.g., indication of programming language(s) used by the programming specialists.

One alternative which should be considered in future surveys is to separate the questionnaire in two parts. One part would be common for all societies and elicit information on broad categories in each area of interest. The second part would be designed to the specific professional interests of each society, and provide as much detail as the individual societies are interested in obtaining.

The wording "direct involvement" also received negative reactions from some respondents, some of whom justifiably objected to the absence of the catch-all category "OTHER" in 10 (a). The intent of the wording was explained in the main body of the report where the findings on Question 10 are presented. It is difficult to say whether "Building of Information Processing Tools" would have been better.

3. Question 11 dealt with Nature of Employer, and response was good (97%). Some respondents remarked that sub-categories of industries other than those directly associated with the information processing field should have been listed explicitly instead of being lumped in one "ALL OTHERS." Preliminary versions of the questionnaire included such industrial categories such as Raw Materials, Mining, Construction, Wholesale and Retail Trade, Insurance, Publishing, Public Utilities, Transportation, etc.

The Statistical Branch of the Bureau of the Budget, whose approval of the questionnaire was required, pointed out that asking a respondent to report the industrial category of his employer is a notoriously difficult problem in survey work and no standard classification exists! In the end, the compromise made was to provide the super-category of PRIVATE INDUSTRY and ask respondents to specify the principal product or service supplied by his employer. (These data were not analyzed because of the difficulty in encoding responses for machine-processing.)

4. Questions 13 and 14 (response was 98% for each) present a potential problem of interpretation. Complex industrial organizations have intricate vertical hierarchies and it is difficult to either define or interpret the limits of an organization. Comparison of the distributions for the entire population and for sub-populations by societies or formal education shows only small variances. Although it is impossible to say precisely how respondents are interpreting the word "organization", it is unlikely that the agreement between these distributions is the result of different interpretations distorting the true situation.

Salary and Income

98.2% of the responses received answered the question on salary earned. A number of respondents who returned filled questionnaires, but did not answer this question, stated that they felt this question was an invasion of privacy. (7 totally blank questionnaires were received with the same statement being applied to the entire questionnaire.)

Question 23 (additional income) was answered by 77% of the total. There were a few comments to the effect that the income intervals were much too detailed.

SURVEY

OF

INFORMATION PROCESSING PERSONNEL

CONDUCTED BY THE

AMERICAN FEDERATION OF INFORMATION PROCESSING SOCIETIES (AFIPS),

THE DATA PROCESSING MANAGEMENT ASSOCIATION (DPMA)

AND THE

NUMERICAL CONTROL SOCIETY (NCS)

IMPORTANT NOTICE

If you are a member of more than one of the participating societies, you will receive a copy of this questionnaire from each society. In this case, **you should complete ONLY ONE form** and destroy the others. Your cooperation in this regard will help assure the validity of the resulting statistics.

Budget Bureau No. 22-S67003
Approval Expires Sept. 30, 196

PERSONAL DATA

1. What is your age?

8-1 ☐ under 25 yr.
-2 ☐ 25-29 yr.
-3 ☐ 30-34 yr.
-4 ☐ 35-39 yr.
-5 ☐ 40-44 yr.
-6 ☐ 45-49 yr.
-7 ☐ 50-54 yr.
-8 ☐ 55-59 yr.
-9 ☐ 60-64 yr.
-0 ☐ 65 or older

2. Sex

9-1 ☐ Male -2 ☐ Female

EDUCATION

3. 10-0 ☐ No college work

4. If you hold no college degree but have done college work indicate approximate number of semester credit hours accumulated:

-1 ☐ 1-49 -2 ☐ 50-99 -3 ☐ 100-149 -4 ☐ 150-199 -5 ☐ over 200

5. College certificate(s) and or degree(s) held and discipline

	Associate of Arts	Bachelor's	Master's	Doctorate
Behavioral and or Social Sciences	11-1 ☐	12-1 ☐	13-1 ☐	14-1 ☐
Education	-2 ☐	-2 ☐	-2 ☐	-2 ☐
Engineering	-3 ☐	-3 ☐	-3 ☐	-3 ☐
Humanities	-4 ☐	-4 ☐	-4 ☐	-4 ☐
Information Processing Sciences	-5 ☐	-5 ☐	-5 ☐	-5 ☐
Mathematics (including Statistics)	-6 ☐	-6 ☐	-6 ☐	-6 ☐
Bio-Medical Sciences	-7 ☐	-7 ☐	-7 ☐	-7 ☐
Physical Sciences	-8 ☐	-8 ☐	-8 ☐	-8 ☐
Other (Please Specify)	-9 ☐	-9 ☐	-9 ☐	-9 ☐

6. Please indicate in the space below the MAJOR subject and year in which certificate(s) and or degree(s) was earned.

MAJOR SUBJECT	YEAR OF DEGREE			
	Assoc. of Arts	Bachelor	Master	Doctorate
	19__	19__	19__	19__
	19__	19__	19__	19__
	19__	19__	19__	19__
	19__	19__	19__	19__
	19__	19__	19__	19__

15-20 ☐☐☐☐☐☐

21-26 ☐☐☐☐☐☐

27-32 ☐☐☐☐☐☐

33-38 ☐☐☐☐☐☐

39-44 ☐☐☐☐☐☐

CURRENT EMPLOYMENT

7. Is your job primarily concerned with computers, data processing, information processing?

45-1 ☐ Yes -2 ☐ No

8. If the answer to the above question is YES, with what type of computing equipment is your job concerned?
(Check all applicable)

46-1 ☐ Analog -2 ☐ Digital -3 ☐ Hybrid

9. For how long have you worked in the computer, data processing, information processing field?

47-1 ☐ Less than 1 yr. -2 ☐ 1 yr. -3 ☐ 2 yr. -4 ☐ 3 yr. -5 ☐ 4 yr.
-6 ☐ 5 yr. -7 ☐ 6 yr. -8 ☐ 7-8 yr. -9 ☐ 9-10 yr. -0 ☐ 11-15 yr.
X ☐ over 15 yr.

10. In what way is your work connected with computers and data processing equipment?

NOTE: Please review entries carefully before answering. Note especially the three broad categories defining connection of work with computers: (a) Directly Involved; (b) As a User; (c) Professional Interest Only.

(Please indicate **one** PRIMARY and **one** SECONDARY connection.)

(a) **Directly Involved**	Primary	Secondary
ENGINEERING		
Circuit, Component and Logical Design	48-1 ☐	49-1 ☐
Computer Architecture	-2 ☐	-2 ☐
Manufacturing	-3 ☐	-2 ☐
Field Engineering (Service, Maintenance, etc.)	-4 ☐	-4 ☐
PROGRAMMING		
Systems Programming	-5 ☐	-5 ☐
Programming Languages and/or Translators	-6 ☐	-6 ☐
Scientific and Engineering Applications	-7 ☐	-7 ☐
Business Applications	-8 ☐	-8 ☐
Artificial Intelligence	-9 ☐	-9 ☐
Research	-0 ☐	-0 ☐
Numerical Control	X ☐	X ☐

	Primary	Secondary
SYSTEMS ENGINEERING/DESIGN	50-1 ☐	52-1 ☐
BUSINESS SYSTEMS/PROCEDURES ANALYSIS	-2 ☐	-2 ☐
LANGUAGE DATA PROCESSING		
Computational Linguistics	-3 ☐	-3 ☐
Machine Translation	-4 ☐	-4 ☐
LIBRARY AND INFORMATION RETRIEVAL	-5 ☐	-5 ☐
COMPUTER AND/OR EAM OPERATIONS		
Management of Facility	-6 ☐	-6 ☐
Equipment Operation	-7 ☐	-7 ☐
Scheduling and Procedures	-8 ☐	-8 ☐
INSTRUCTION/TRAINING		
Hardware Systems	-9 ☐	-9 ☐
Programming	-0 ☐	-0 ☐
Operations	X ☐	X ☐
SALES AND/OR MARKETING	Y ☐	Y ☐
(b) **As a User**		
SCIENTIFIC AND/OR ENGINEERING PROBLEMS	51-1 ☐	53-1 ☐
BUSINESS AND/OR ADMINISTRATION PROBLEMS	-2 ☐	-2 ☐
OPERATIONS (PROCESS CONTROL REAL-TIME OPERATIONS, etc.)	-3 ☐	-3 ☐
NUMERICAL CONTROL	-4 ☐	-4 ☐
STUDENT	-5 ☐	-5 ☐
OTHER (Please Specify)	-6 ☐	-6 ☐
(c) **Professional Interest Only, Because of Possible Implications For:**		
CORPORATE OPERATIONS	-7 ☐	-7 ☐
GOVERNMENT OPERATIONS	-8 ☐	-8 ☐
SOCIAL INSTITUTIONS	-9 ☐	-9 ☐

11. Check the category which is most appropriate for the organization by which you are presently employed. (Check one)

54-1 ☐ SELF-EMPLOYED*

PRIVATE INDUSTRY OR BUSINESS* (including Non-Profit Institutions)

-2 ☐ Computer and/or Electronic Accounting Machines Equipment
-3 ☐ Computer Services
-4 ☐ Technical and/or Scientific Studies
-5 ☐ All Others
-6 ☐ EDUCATIONAL INSTITUTIONS

FEDERAL GOVERNMENT

-7 ☐ Military-Active Duty
-8 ☐ Civilian Employee
-9 ☐ STATE OR MUNICIPAL GOVERNMENT
-0 ☐ OTHER (Please Specify) _____

* Please specify the principal product or service supplied by your present employer (or yourself, if self-employed):

12 In what major component of the organization do you work? (Check one)

55-1 ☐ Marketing
-2 ☐ Finance
-3 ☐ Engineering
-4 ☐ Manufacturing
-5 ☐ Administration and/or Personnel
-6 ☐ Research & Development
-7 ☐ Computing, Data Processing or Information Services (Check this box only if Computing, Data Processing or Information Services is not included in any of the preceding components.)
-8 ☐ Education and/or Training
-9 ☐ Student Body
-0 ☐ Professional Services and/or Consulting
X ☐ Other (Please specify)

13. What is the approximate size of the organization by which you are presently employed?

56-1 ☐ 1-10 -2 ☐ 11-50 -3 ☐ 51-100 -4 ☐ 101-250 -5 ☐ 251-500
-6 ☐ 501-1,000 -7 ☐ 1,001-2,500 -8 ☐ 2,501-5,000
-9 ☐ 5,001-10,000 -0 ☐ Over 10,000

14. What is the estimated number of employees in your organization who are **directly** involved in computer, data and information processing activities?

57-1 ☐ 1-10 -2 ☐ 11-25 -3 ☐ 26-50 -4 ☐ 51-100 -5 ☐ 101-250
-6 ☐ 251-500 -7 ☐ 501-1,000 -8 ☐ Over 1,000

15. Number of years with present organization.

58-1 ☐ 1 yr. -2 ☐ 2 yrs. -3 ☐ 3 yrs. -4 ☐ 4 yrs. -5 ☐ 5 yrs.
-6 ☐ 6-10 yrs. -7 ☐ 11-15 yrs. -8 ☐ 16-20 yrs. -9 ☐ 21-25 yrs.
-0 ☐ Over 25 yrs.

16. Number of industrial, governmental or academic organizations worked for full time since entering the computing or data processing field:

59-1 ☐ 1 -2 ☐ 2 -3 ☐ 3 -4 ☐ 4 -5 ☐ 5 -6 ☐ 6 -7 ☐ 7 -8 ☐ 8
-9 ☐ 9 -0 ☐ 10 X ☐ Over 10

17. If you are listed by your employer on his organization chart as being in a supervisory position, indicate the total number of people over whom you have supervisory responsibility:
60-1 ☐ 1 -2 ☐ 2-5 -3 ☐ 6-10 -4 ☐ 11-40 -5 ☐ 41-100
-6 ☐ Over 100

18. Your current work location:
If in U.S. indicate your Zip Code ☐☐☐☐☐ 61-63
If in Canada, in what Province
If foreign, in what country

SALARY AND INCOME DATA

19. How many actual hours per week do you work on the average for your employer?
64-1 ☐ Less than 35 -2 ☐ 35-39 -3 ☐ 40-45 -4 ☐ 46-50 -5 ☐ 51-55
-6 ☐ Over 55

20. How many **working days** of paid vacation do you receive each year?
65-1 ☐ Less than 5 -2 ☐ 5-10 -3 ☐ 11-15 -4 ☐ 16-20 -5 ☐ Over 20

21. Please indicate current basic annual salary or income derived from primary occupation or professional activities (Do not include bonuses, overtime, or other extraordinary income.)

66-1 ☐ Less than $6,000
-2 ☐ $6,000-6,999
-3 ☐ 7,000-7,999
-4 ☐ 8,000-8,999
-5 ☐ 9,000-9,999
-6 ☐ 10,000-10,999
-7 ☐ 11,000-11,999
-8 ☐ 12,000-12,999
-9 ☐ 13,000-13,999
-0 ☐ 14,000-14,999
67-1 ☐ 15,000-15,999
-2 ☐ 16,000-16,999
-3 ☐ 17,000-17,999
68-1 ☐ $18,000-18,999
-2 ☐ 19,000-19,999
-3 ☐ 20,000-21,999
-4 ☐ 22,000-23,999
-5 ☐ 24,000-25,999
-6 ☐ 26,000-27,999
-7 ☐ 28,000-29,999
-8 ☐ 30,000-34,999
-9 ☐ 35,000-39,999
-0 ☐ 40,000-44,999
69-1 ☐ 45,000-49,999
-2 ☐ Over 50,000

22. Academics please check one of the following:
Income range checked in previous question was for:
70-1 ☐ 9-month academic year
-2 ☐ 12-month period

23. Please indicate **additional** annual income derived from non-primary occupation or professional activities, including professional fees, bonuses, overtime, royalties, etc.:

71-1 ☐ Less than $100
-2 ☐ $100-499
-3 ☐ 500-999
-4 ☐ 1,000-1,499
-5 ☐ 1,500-1,999
-6 ☐ 2,000-2,999
-7 ☐ 3,000-3,999
-8 ☐ 4,000-4,999
-9 ☐ 5,000-5,999
-0 ☐ 6,000-6,999
72-1 ☐ 7,000-7,999
-2 ☐ 8,000-8,999
-3 ☐ 9,000-9,999
-4 ☐ 10,000-11,999
73-1 ☐ $12,000-13,999
-2 ☐ 14,000-15,999
-3 ☐ 16,000-17,999
-4 ☐ 18,000-19,999
-5 ☐ 20,000-21,999
-6 ☐ 22,000-23,999
-7 ☐ 24,000-25,999
-8 ☐ 26,000-27,999
-9 ☐ 28,000-29,999
-0 ☐ 30,000-34,999
74-1 ☐ 35,000-39,999
-2 ☐ 40,000-44,999
-3 ☐ 45,000-49,999
-4 ☐ Over 50,000

PROFESSIONAL ACTIVITIES

24. What professional licenses or certificates do you hold?
75-1 ☐ None
-2 ☐ Certificate of Data Processing (CDP)
-3 ☐ Professional Engineer's License
-4 ☐ Other (Please specify) _____

25. What is your professional society and/or association membership? (Check ALL applicable)
76-1 ☐ ACM -2 ☐ ADI -3 ☐ AMTCL -4 ☐ DPMA -5 ☐ IEEE Computer Group -6 ☐ NCS -7 ☐ SCI -8 ☐ SLA

26. Indicate the number of other professional societies of which you are a member.
77-0 ☐ None -1 ☐ 1 -2 ☐ 2 -3 ☐ 3 -4 ☐ 4 -5 ☐ Over 4
Please list these societies. (Do not use abbreviations):

_____

_____

Return in enclosed envelope to:

AFIPS
P. O. Box 30160
Washington, D. C. 20014

APPENDIX C

CUC PROCEDURES FOR HANDLING SURVEY QUESTIONNAIRE

I. GENERAL

A. 1. A post office box (30160) in Post Office 20014 has been secured for the single purpose of the receipt of AFIPS questionnaires. There are two keys to this box: one held by an assistant manager of the Washington office, the other by the Project Manager. The Project Manager is the only person authorized to receive AFIPS mail at the post office.

2. All mail opening and coding of questionnaires is done in the project office where all of the project material is stored in files or folders.

3. All keypunching/verifying is done in the keypunch room, which is located near the project office. When keypunching/verifying is in process, a RESTRICTED sign is placed on the only entrance to this office. If, in the course of keypunching/verifying, at least one member of the project team is not present, all project materials are returned to the project office and picked up again when necessary. Keypunching/verifying will be accomplished at specified times during which no other general keypunch work will be done in that office.

B. *CUC Facilities*

1. Our Washington office has a SECRET facility clearance.

2. Although CUC occupies office space on three floors, all AFIPS Survey materials are being processed on the same level of the building.

3. A locked project office on this level has been established for the project manager. All project materials are stored in this office, which is located near our data preparation facility and computer but is, however, in the rear of our office space where there is very little outside traffic.

C. *Personnel*

1. Mr. Frank M. Leonard is serving as Project Manager. He reports directly to Mr. Richard Clikeman, an assistant manager of the Washington office. Mrs. Josephine Lewis supervises all keypunch and clerical activities and reports to Mr. Leonard on technical project matters and administratively to Mr. Clikeman.

2. At the present time, access to the questionnaire information is limited to Mr. Leonard, Mrs. Lewis, two keypunch operators/clerks, and Mr. Clikeman (need-to-know only).

3. Only the Project Manager and the Manager of our Computer Time Sales activity, who is responsible for all facilities on this floor level, have keys to the project office.

4. The project office is kept locked whenever an authorized project team member is not in the office.

II. PROCEDURES

A. *Receiving*

1. Mail is picked up at the post office by the Project Manager and postage receipts are filed by him in the project file.

2. Prepaid mail is retained by the Project Manager, who takes it directly to the project office for processing. "Postage due" mail, which is batched by the post office, is placed in mail bags by the Project Manager, who then delivers the bags directly to the project office for storage and subsequent processing.

B. *Opening*

1. *Prepaid Mail*

a. Opened by the Project Manager only and envelopes, marked or unmarked, are immediately destroyed by him.

b. Any enclosures are removed from the questionnaire and filed in folders which identify the organization; e.g., ACM, IEEE.

c. Questionnaires which bear notes or markings other than those prescribed are extracted and filed separately by the Project Manager.

d. All other questionnaires are then batched and filed preparatory to further processing.

2. *Postage Due (Bulk) Mail*

a. Received by the keypunch/clerical supervisor in batches of approximately 100 and opened by her or her two keypunch operators.

b. All envelopes with return addresses are given directly to the Project Manager for destruction.

c. All other envelopes are destroyed by her or her two assistants.

d. Any enclosures found within the questionnaires are collected by the keypunch supervisor, who delivers them to the Project Manager for storage.

e. Any questionnaires which have identifying marks or notes written on them are treated as in item d. above.

f. All unmarked questionnaires are appropriately folded, rebatched and returned to the Project Manager for interim storage.

III. PRE-PROCESSING

A. 1. Unmarked questionnaires enter the job stream in batches of 100. They are edited for legibility and valid response. Certain open-end questions are coded.

2. Samples of coded questionnaires are checked for validity by the Project Manager.

B. Coded questionnaires are keypunched and keyverified.

C. To date (December 20, 1967) questionnaires which have identifying markings are in a wait-state file pending AFIPS decision as to their disposal, which can take one of three forms:

1. To use as they are, in which case they will enter the normal job stream;
2. To be destroyed directly;
3. To be transcribed onto blank questionnaires, the originals being destroyed.

D. Questionnaires which have been keypunched and verified will be returned to the Project Manager for storage.

E. Punched and verified data cards will be given to the Project Manager for interim storage.

F. 1. After all questionnaires have been punched and verified, the data will be transferred to magnetic tape (column binary). The Project Manager will be present to insure security.

2. Data cards and data tapes will be returned to the Project Manager for storage.

IV. PROCESSING

After all data has been converted to magnetic tape and after processing specifications have been defined, the Project Manager will draw up the requisite parameter cards and personally supervise the tabulation of the data. All project materials will be held by the Project Manager at this point.

V. DISPOSITION OF PROJECT MATERIALS

A. All post office receipts will be mailed (registered mail) to AFIPS headquarters each month, per conversation of December 15, 1967

B. At the completion of all pre-processing, namely: edit and code, punch and verify, card-to-tape, and cleaning, all questionnaires and data cards will be shipped by the Project Manager to AFIPS headquarters, registered and insured.

C. Pending AFIPS negotiations with the member societies, the data tape will be held for further post-processing.

D. All enclosures (letters, notes, etc.), together with all tabulations and statistical output, will be hand-carried by the Project Manager to Mr. I. D. Nehama, AFIPS Committee Chairman, for analysis.

KEYPUNCH VERIFICATION PROCEDURES

At the start of keypunch operation, verification was 100%. That is, all output from all keypunchers was verified. After a sufficient number of questionnaires had been verified, to allow the keypunch supervisors to determine the probability of error for each question, partial verification procedures were instituted as:

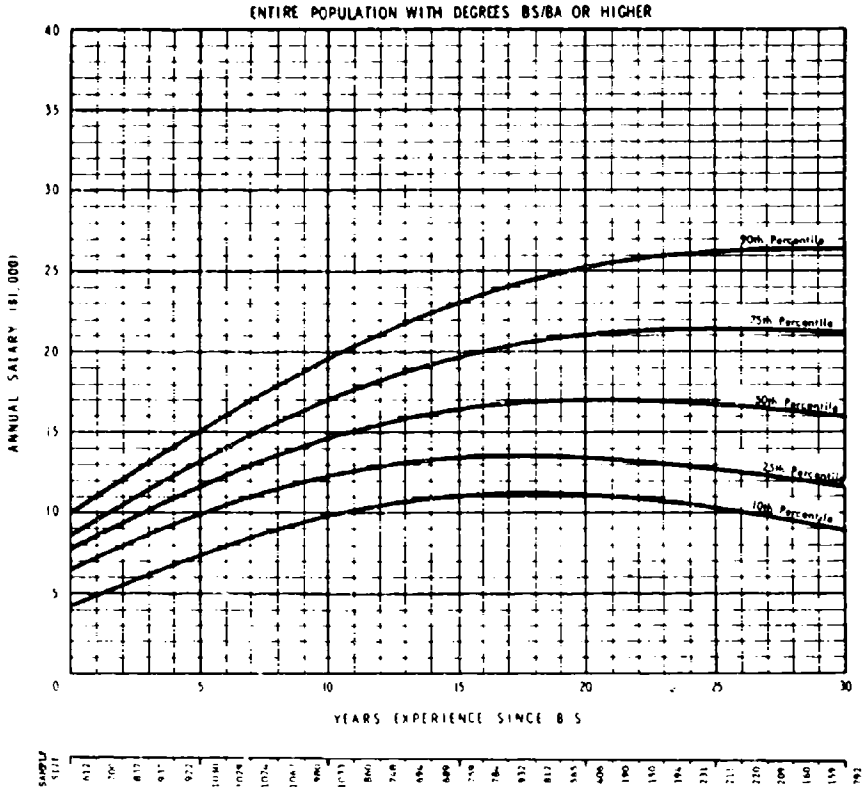
a. Complete verification of the first half hour of output for each keypuncher each day.
b. Complete verification of all questions shown likely to have unacceptably high error rates.
c. Random verification of all other questions with additional verification where the spot check showed any additional need.

Following the verification procedures, straight tabulations were produced for all questions as an additional check upon the production of invalid codes. Straight tabulations indicated that the rate of production of invalid codes in all cases was less than 10 out of 30,000.

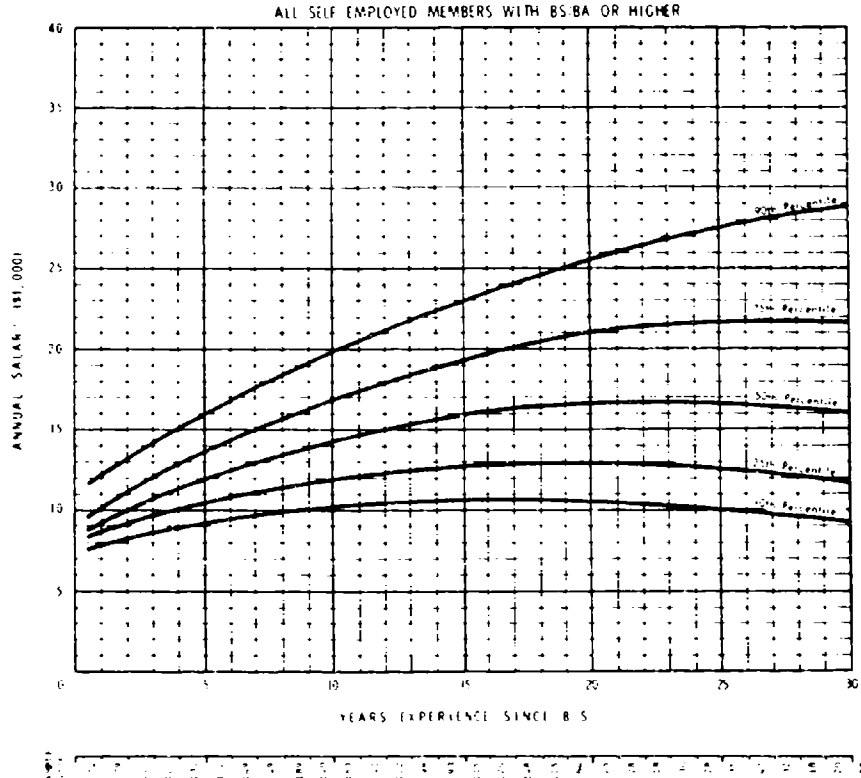
APPENDIX D

Detailed Salary Findings

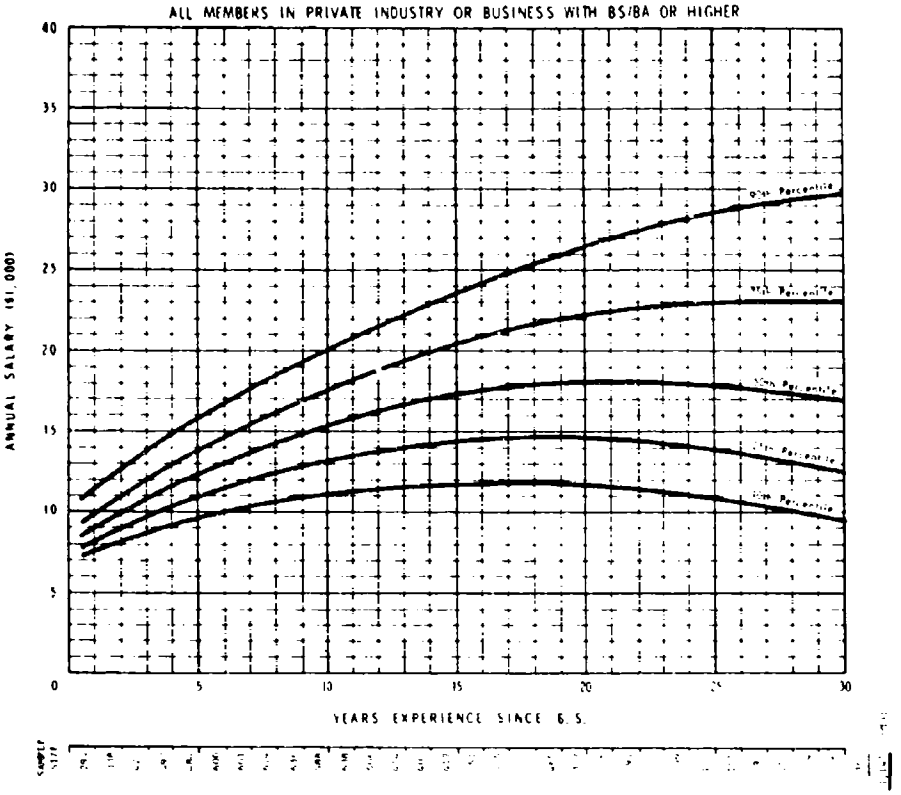
GRAPH 1
ENTIRE POPULATION WITH DEGREES BS/BA OR HIGHER



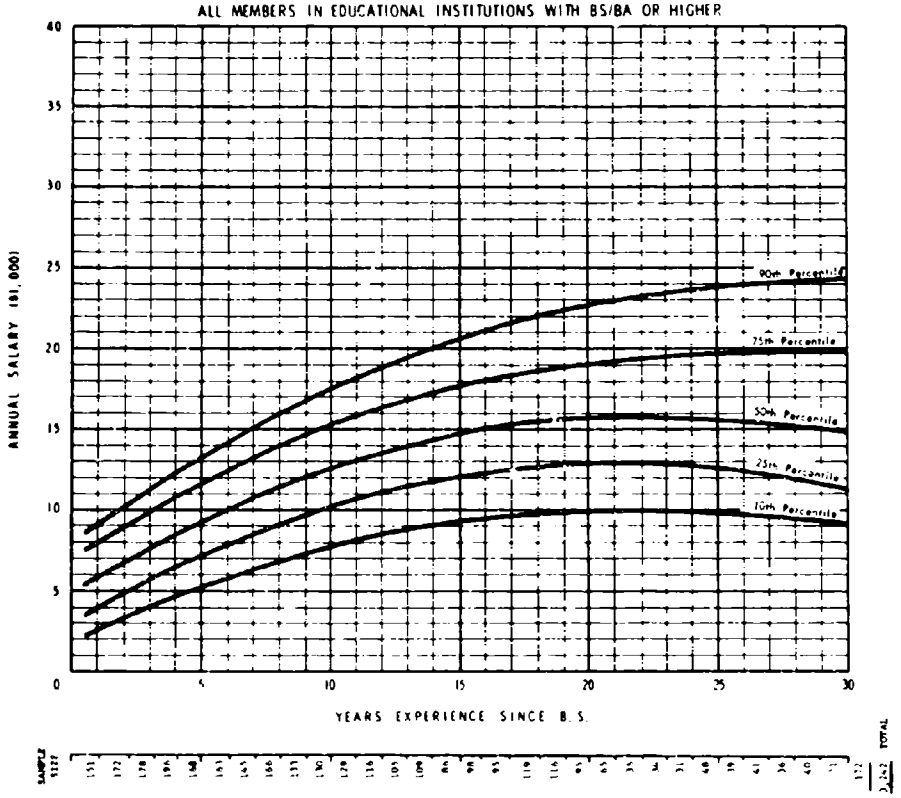
GRAPH 2
ALL SELF EMPLOYED MEMBERS WITH BS/BA OR HIGHER



GRAPH 3
ALL MEMBERS IN PRIVATE INDUSTRY OR BUSINESS WITH BS/BA OR HIGHER

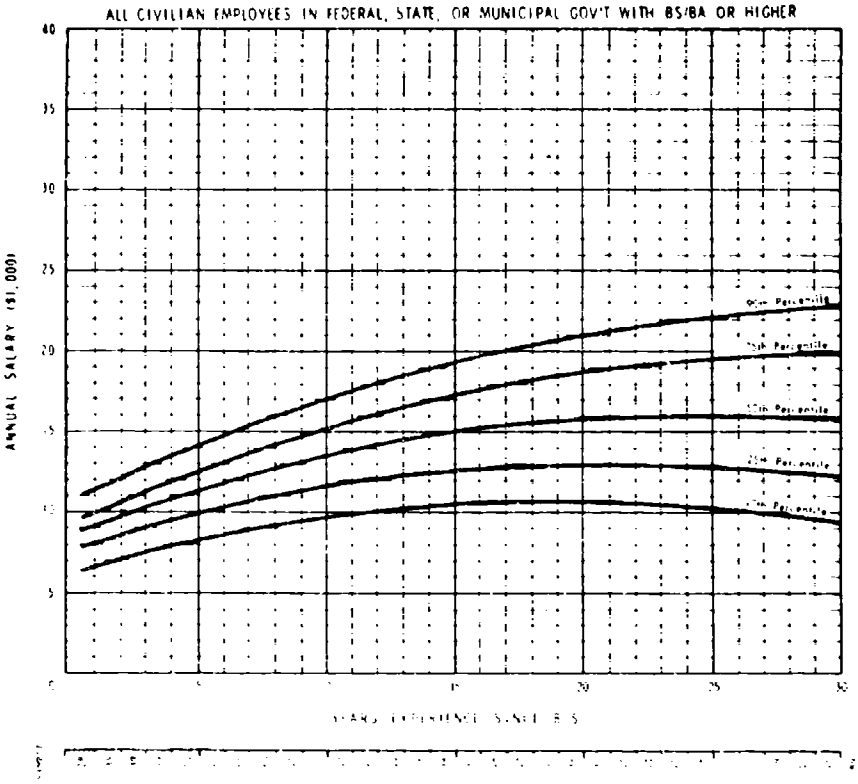


GRAPH 4
ALL MEMBERS IN EDUCATIONAL INSTITUTIONS WITH BS/BA OR HIGHER



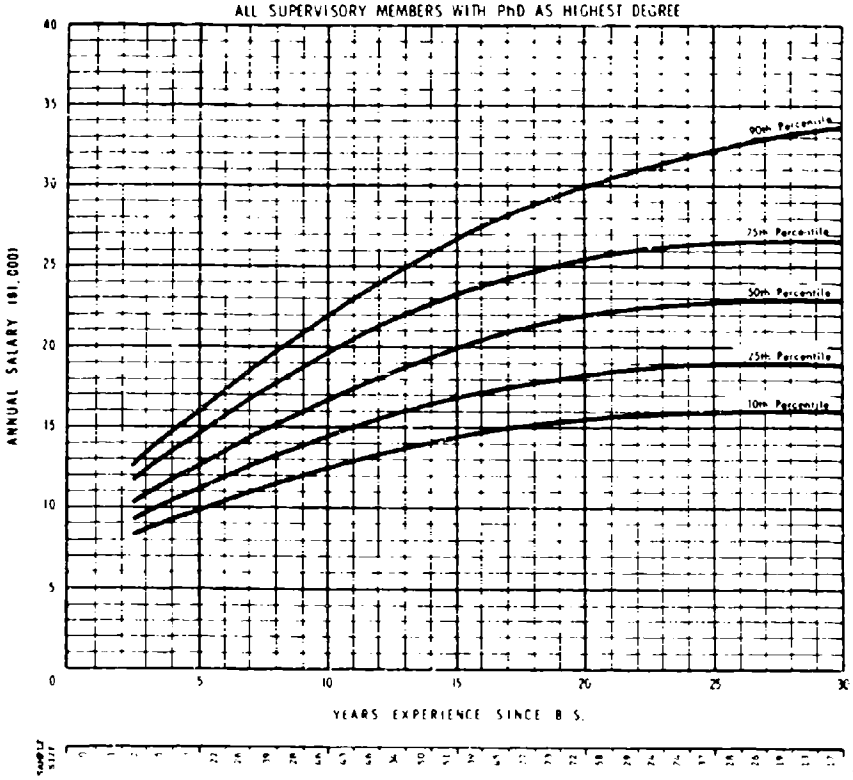
GRAPH 5

ALL CIVILIAN EMPLOYEES IN FEDERAL, STATE, OR MUNICIPAL GOV'T WITH BS/BA OR HIGHER

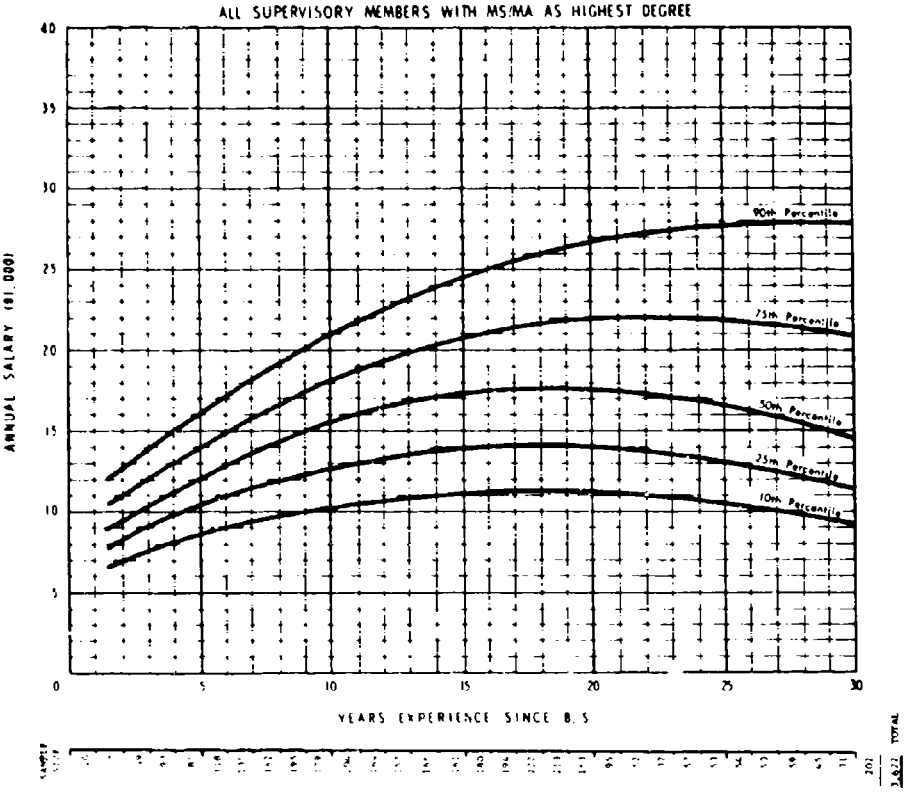


GRAPH 6

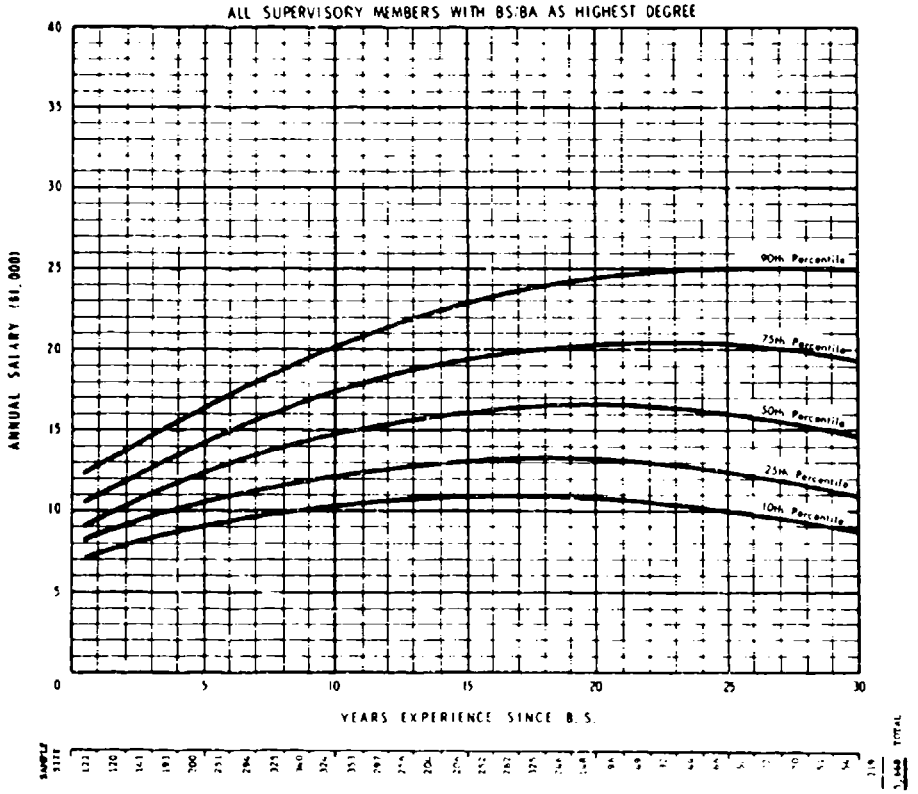
ALL SUPERVISORY MEMBERS WITH PhD AS HIGHEST DEGREE



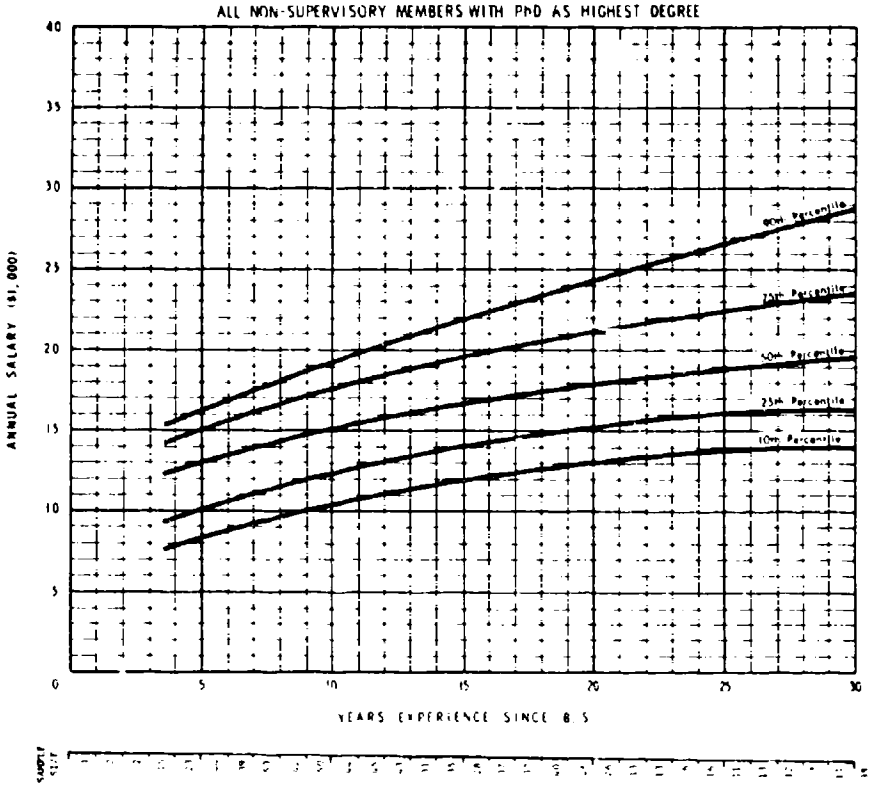
GRAPH 7
ALL SUPERVISORY MEMBERS WITH MS/MA AS HIGHEST DEGREE



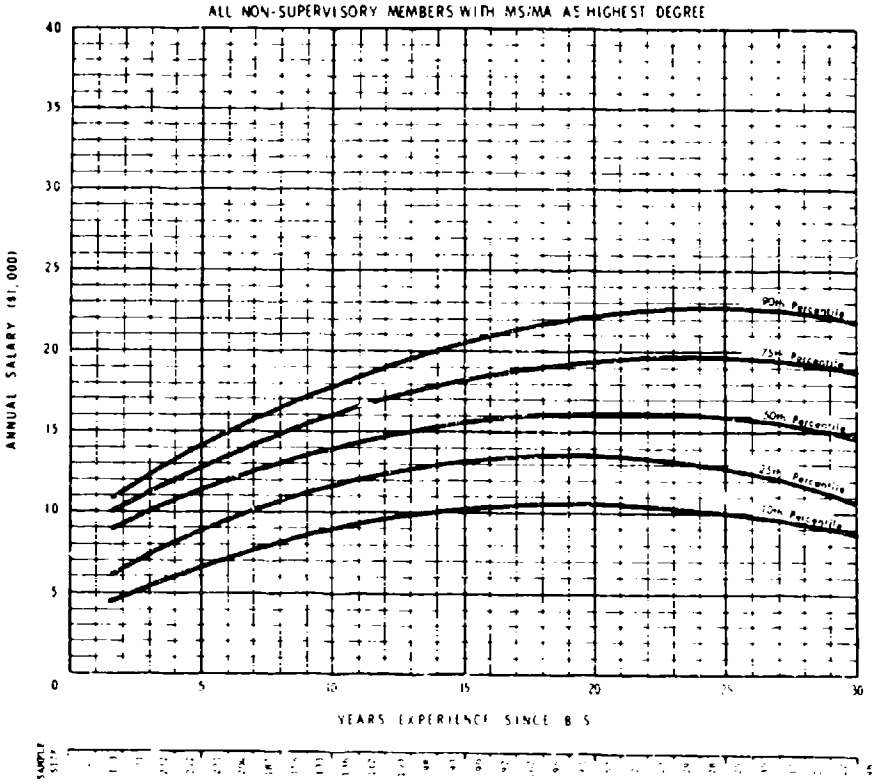
GRAPH 8
ALL SUPERVISORY MEMBERS WITH BS/BA AS HIGHEST DEGREE



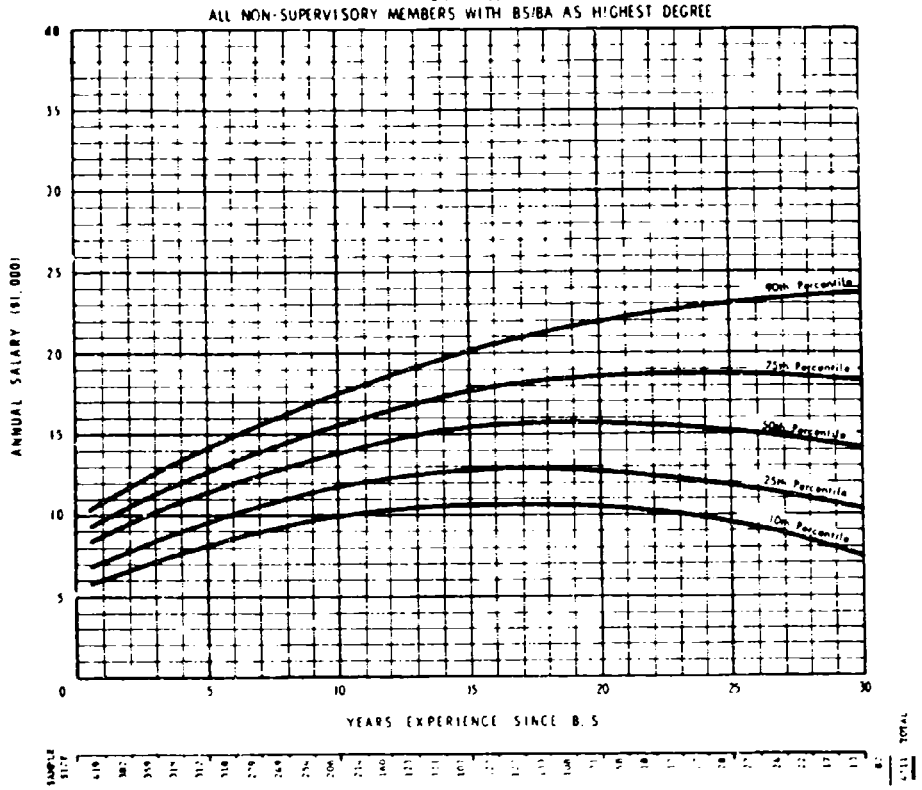
GRAPH 9
ALL NON-SUPERVISORY MEMBERS WITH PhD AS HIGHEST DEGREE



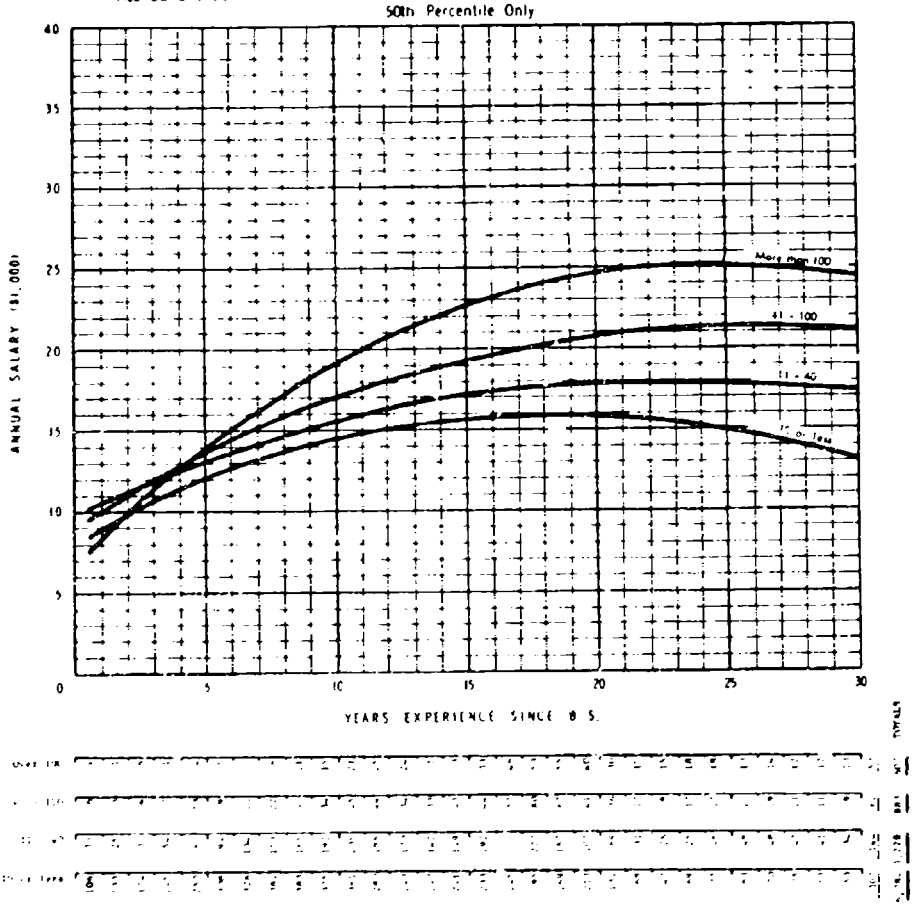
GRAPH 10
ALL NON-SUPERVISORY MEMBERS WITH MS/MA AS HIGHEST DEGREE



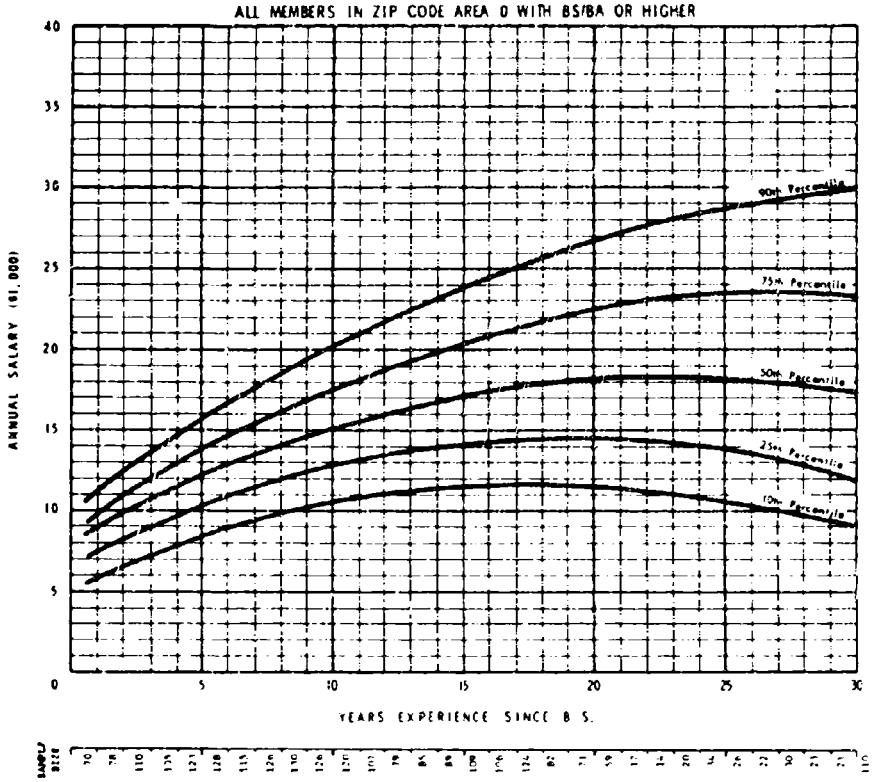
GRAPH 11
ALL NON-SUPERVISORY MEMBERS WITH BS/BA AS HIGHEST DEGREE



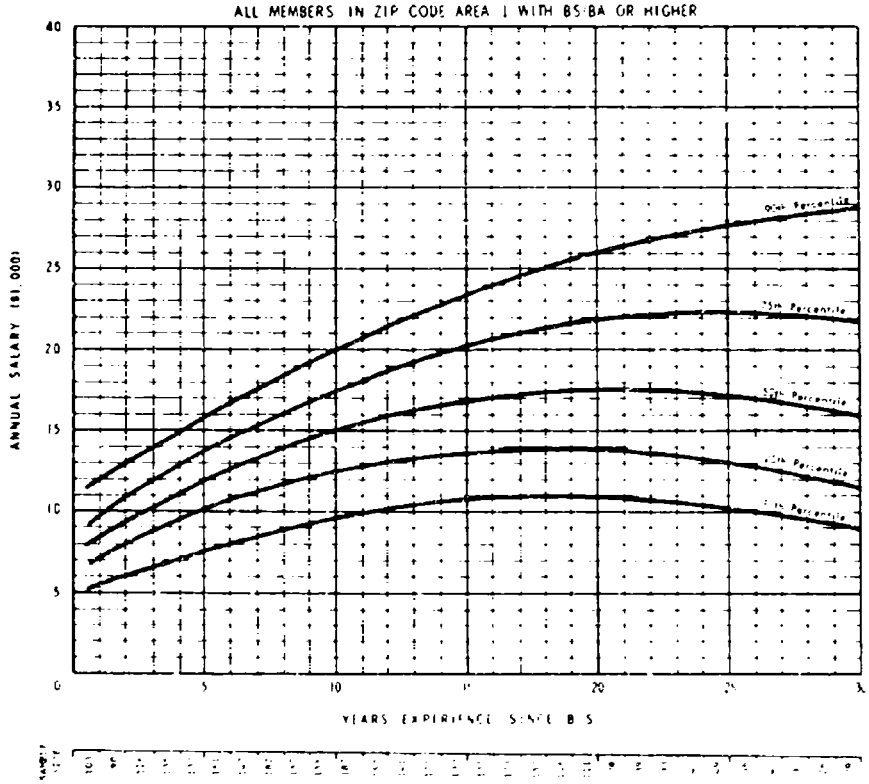
GRAPH 12
ALL SUPERVISORY PERSONNEL WITH BS/BA OR HIGHER BY NUMBER OF PEOPLE SUPERVISED
50th Percentile Only



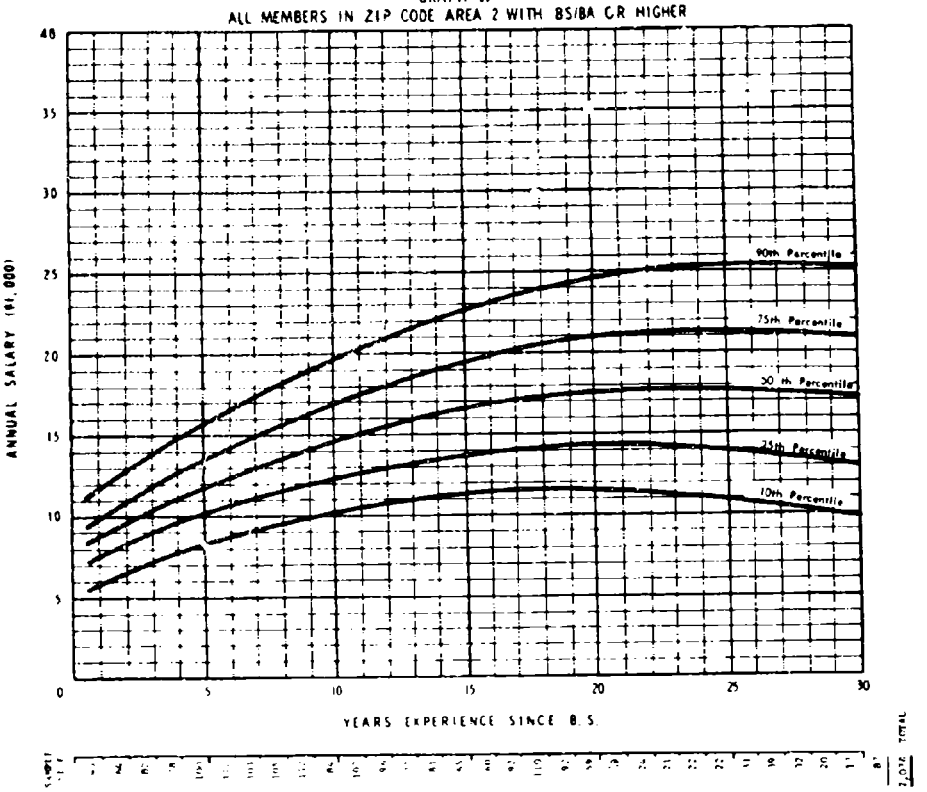
GRAPH 13
ALL MEMBERS IN ZIP CODE AREA 0 WITH BS/BA OR HIGHER



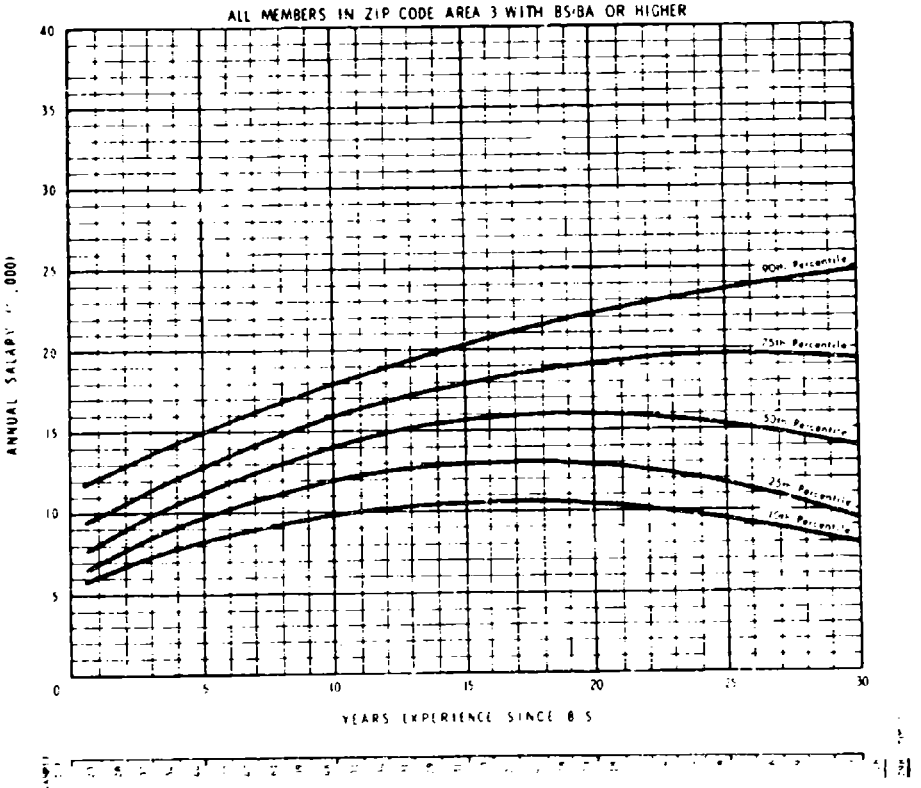
GRAPH 14
ALL MEMBERS IN ZIP CODE AREA 1 WITH BS/BA OR HIGHER



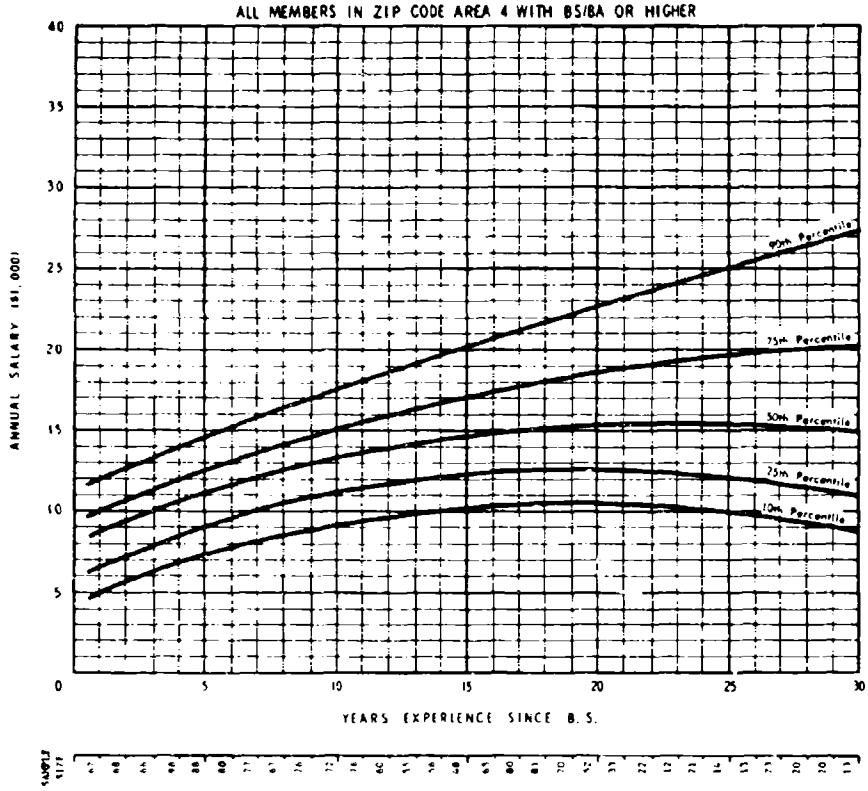
GRAPH 15
ALL MEMBERS IN ZIP CODE AREA 2 WITH BS/BA OR HIGHER



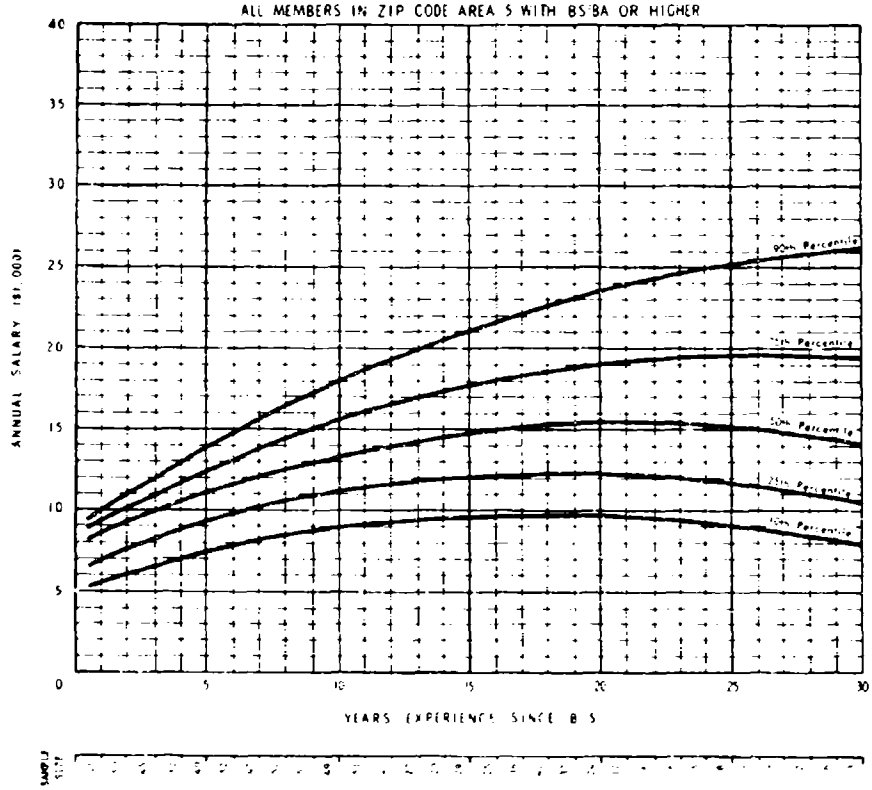
GRAPH 16
ALL MEMBERS IN ZIP CODE AREA 3 WITH BS/BA OR HIGHER



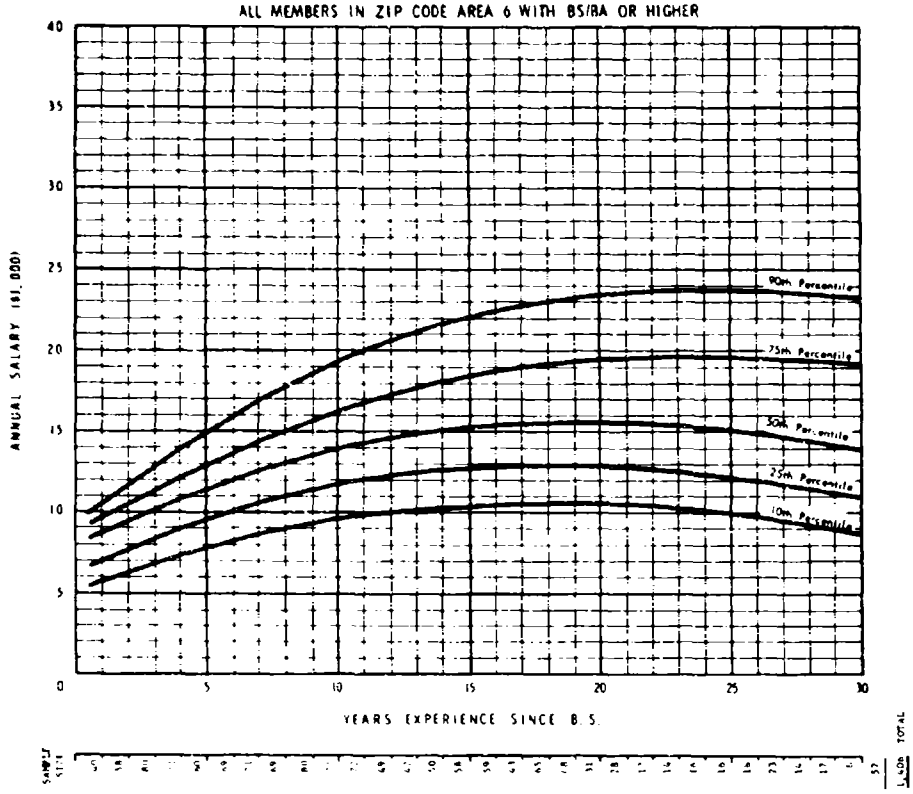
GRAPH 17
ALL MEMBERS IN ZIP CODE AREA 4 WITH BS/BA OR HIGHER



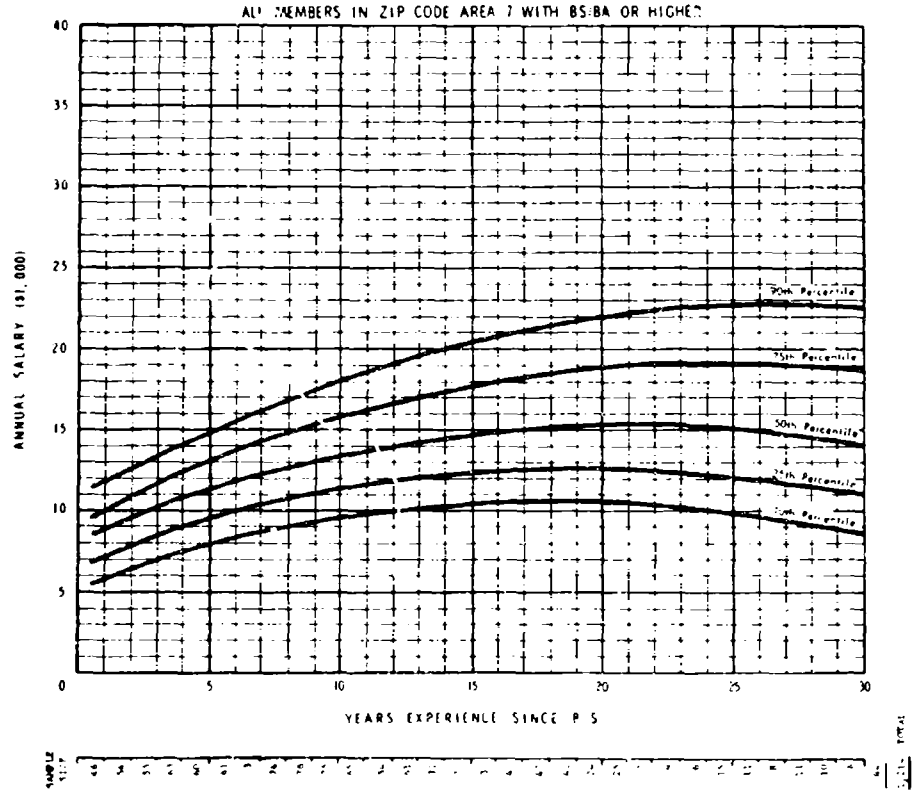
GRAPH 18
ALL MEMBERS IN ZIP CODE AREA 5 WITH BS/BA OR HIGHER



GRAPH 19
ALL MEMBERS IN ZIP CODE AREA 6 WITH BS/BA OR HIGHER

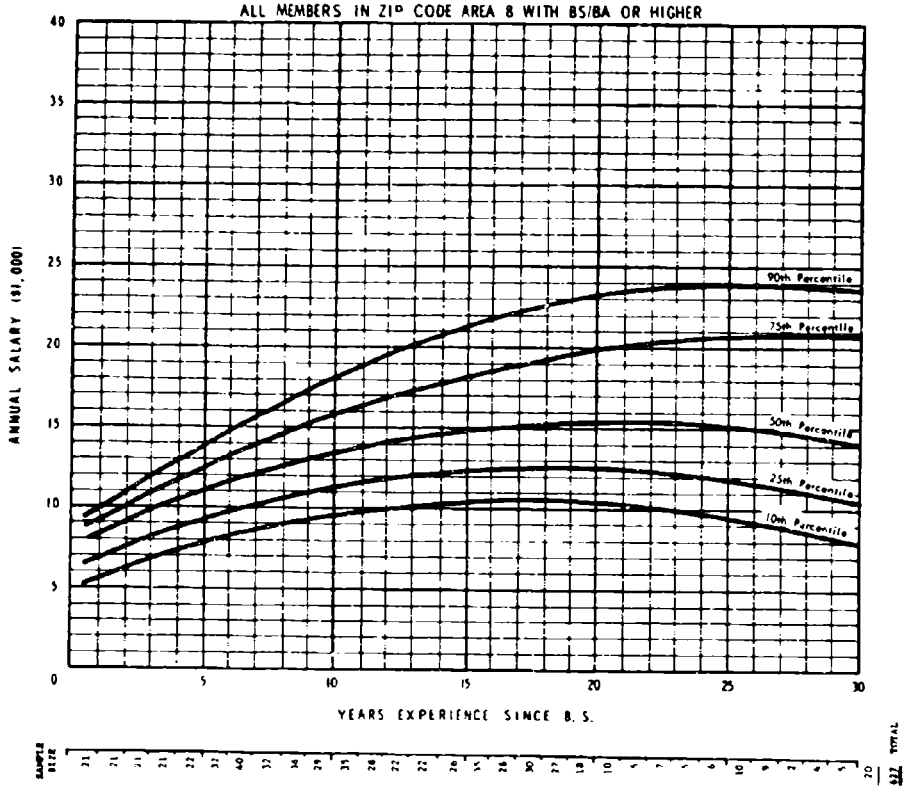


GRAPH 20
ALL MEMBERS IN ZIP CODE AREA 7 WITH BS/BA OR HIGHER



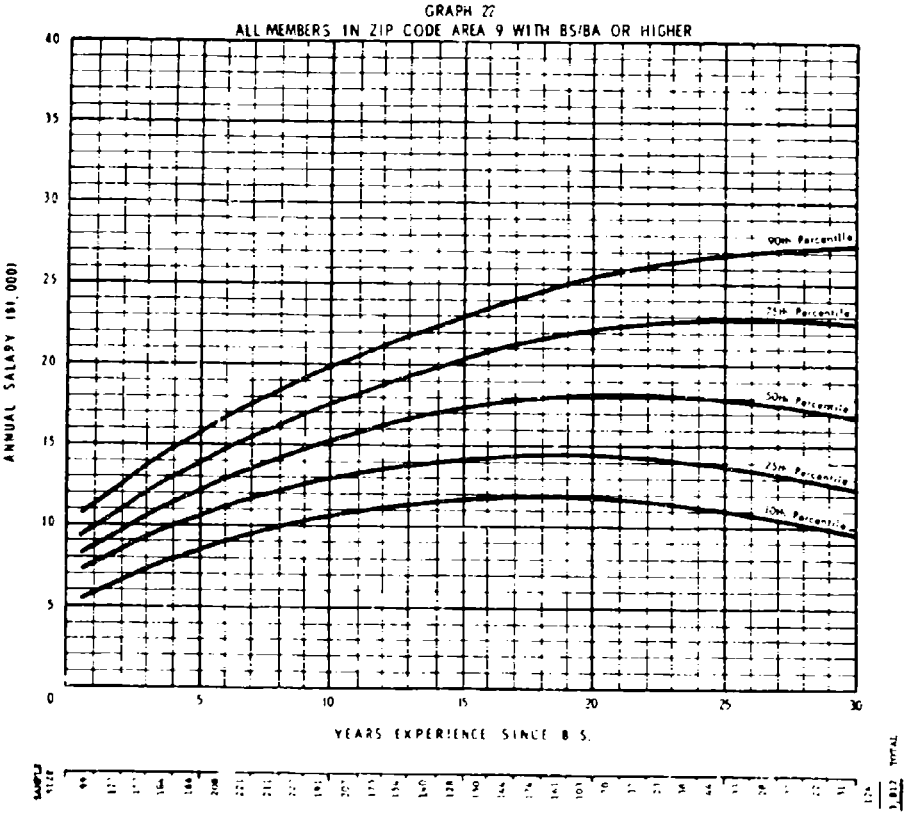
GRAPH 21

ALL MEMBERS IN ZIP CODE AREA 8 WITH BS/BA OR HIGHER

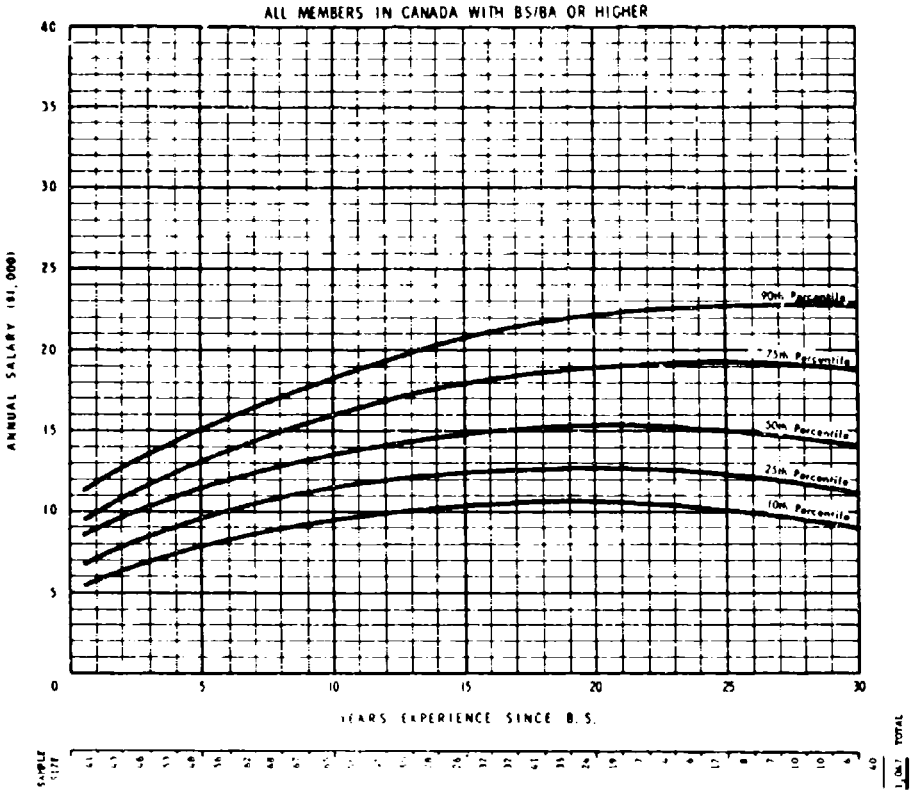


GRAPH 22

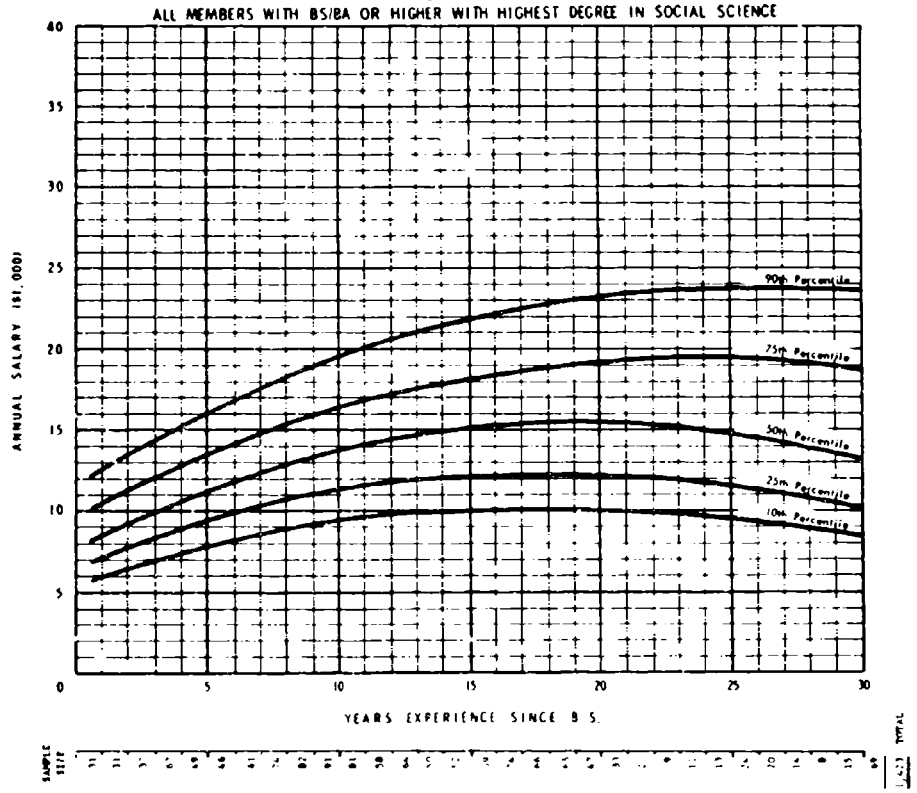
ALL MEMBERS IN ZIP CODE AREA 9 WITH BS/BA OR HIGHER



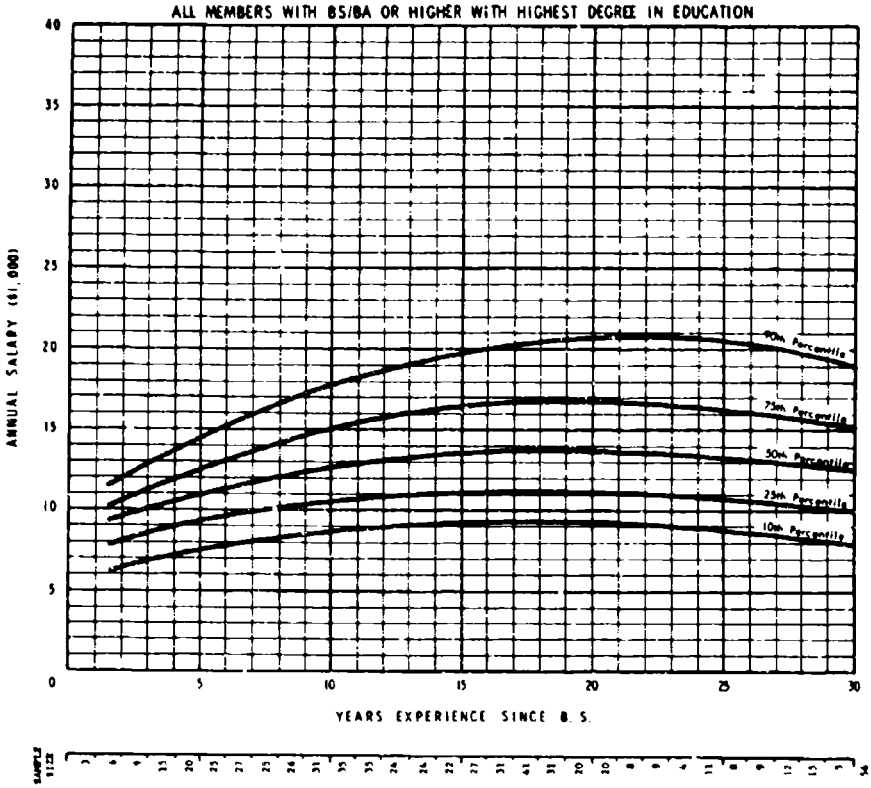
GRAPH 23
ALL MEMBERS IN CANADA WITH BS/BA OR HIGHER



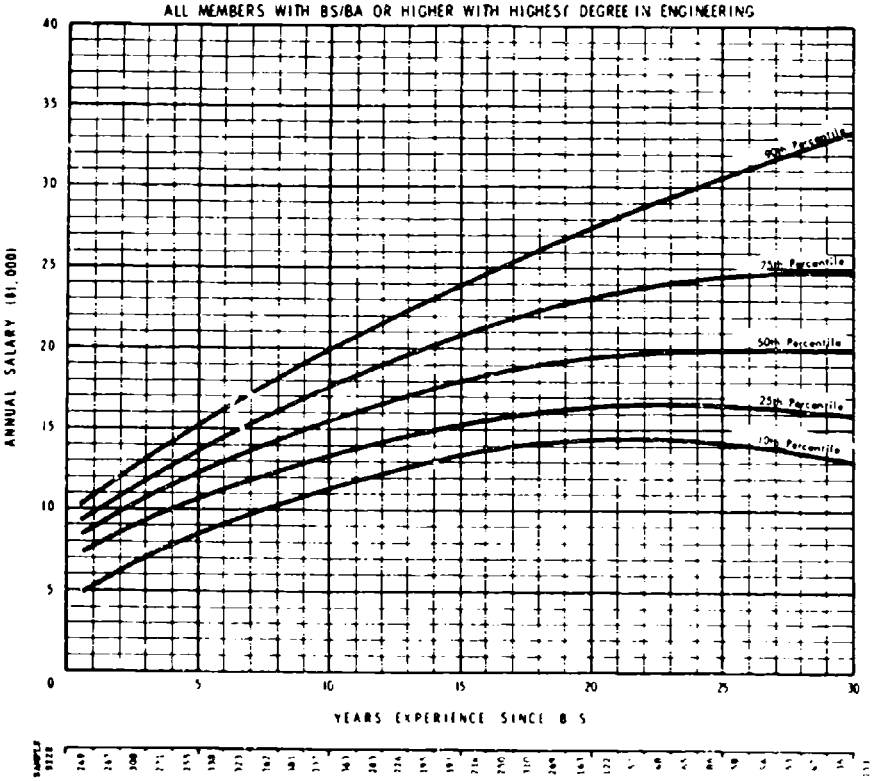
GRAPH 24
ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN SOCIAL SCIENCE



GRAPH 25
ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN EDUCATION

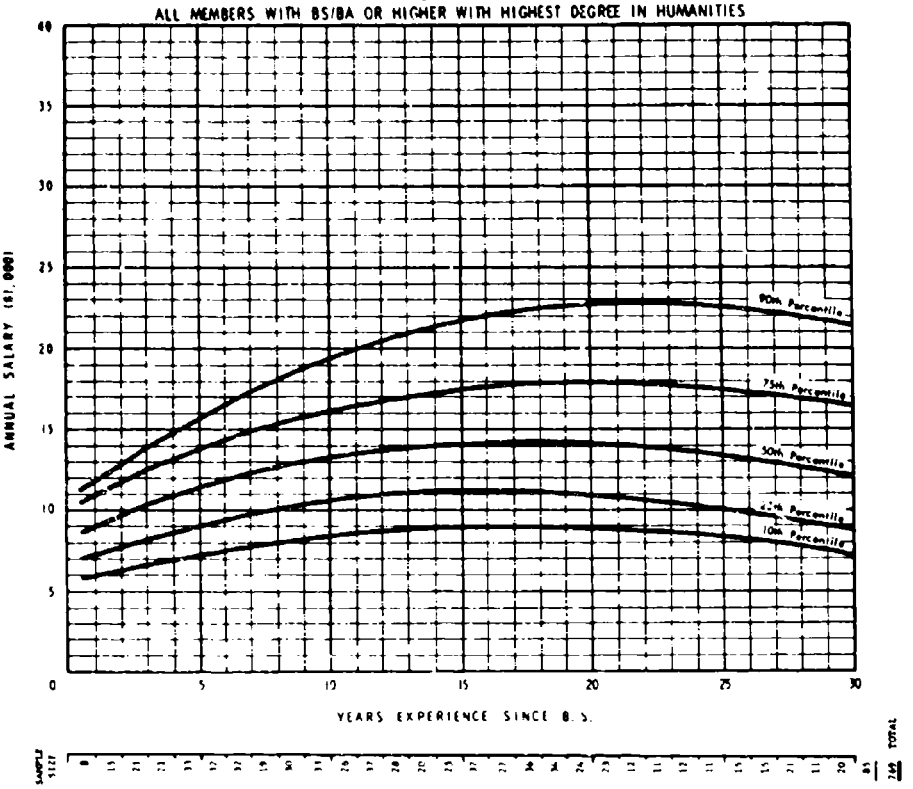


GRAPH 26
ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN ENGINEERING



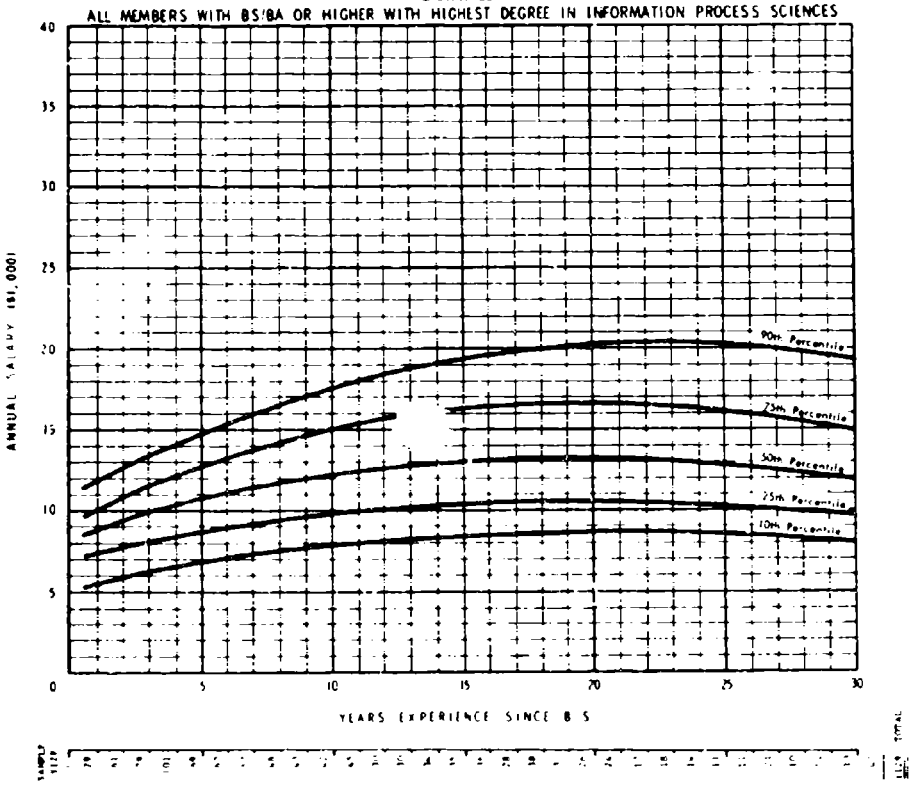
GRAPH 27

ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN HUMANITIES



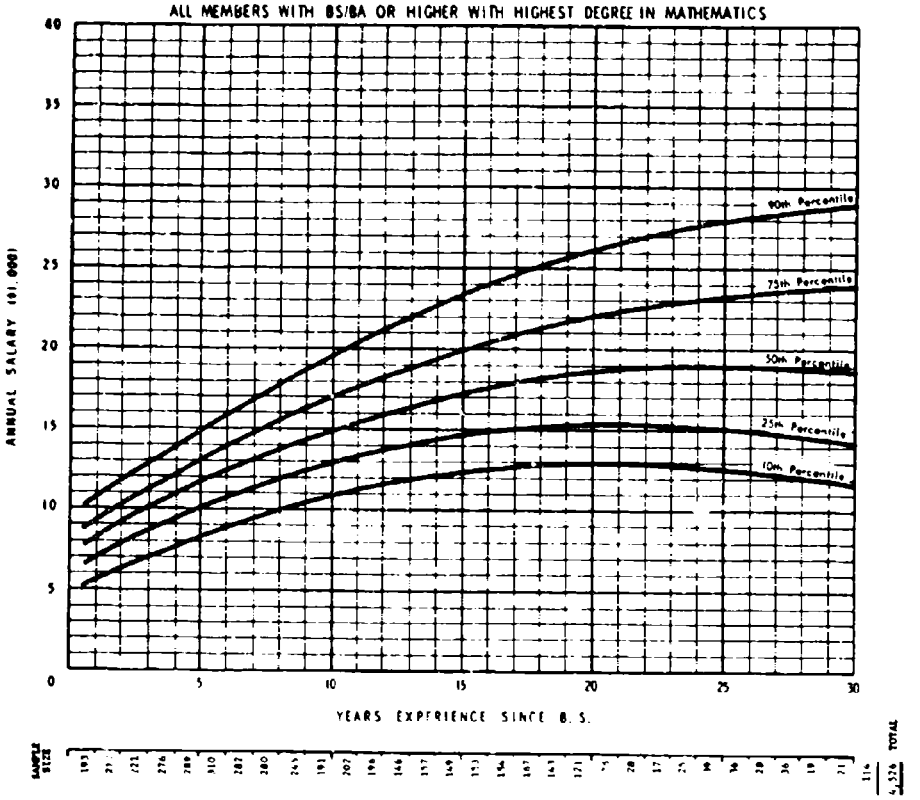
GRAPH 28

ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN INFORMATION PROCESS SCIENCES



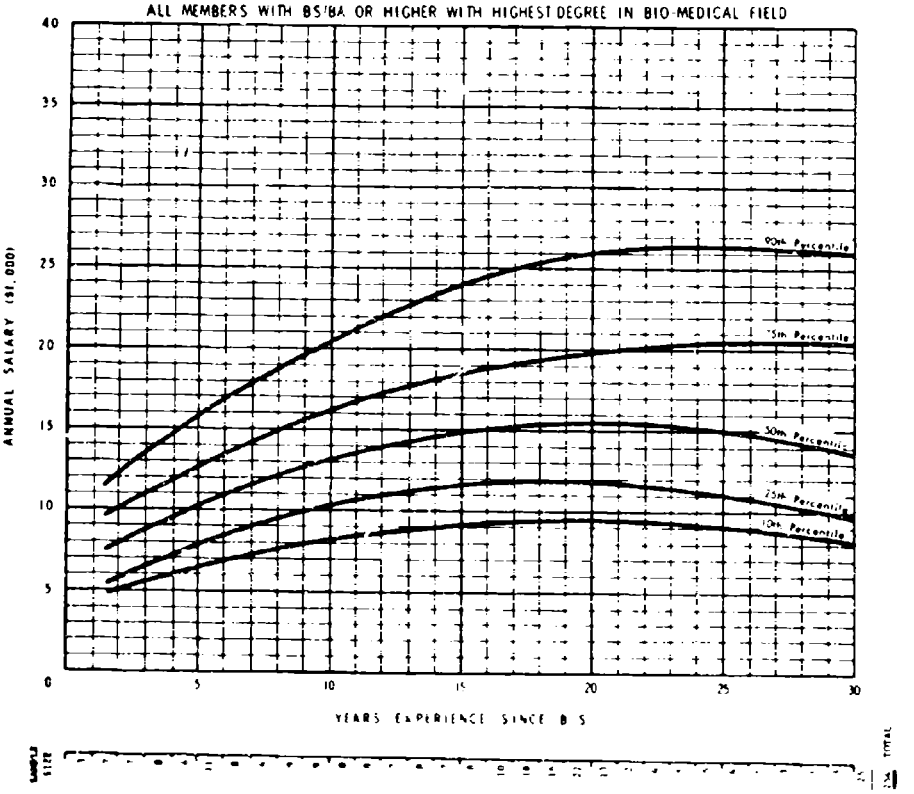
GRAPH 29

ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN MATHEMATICS



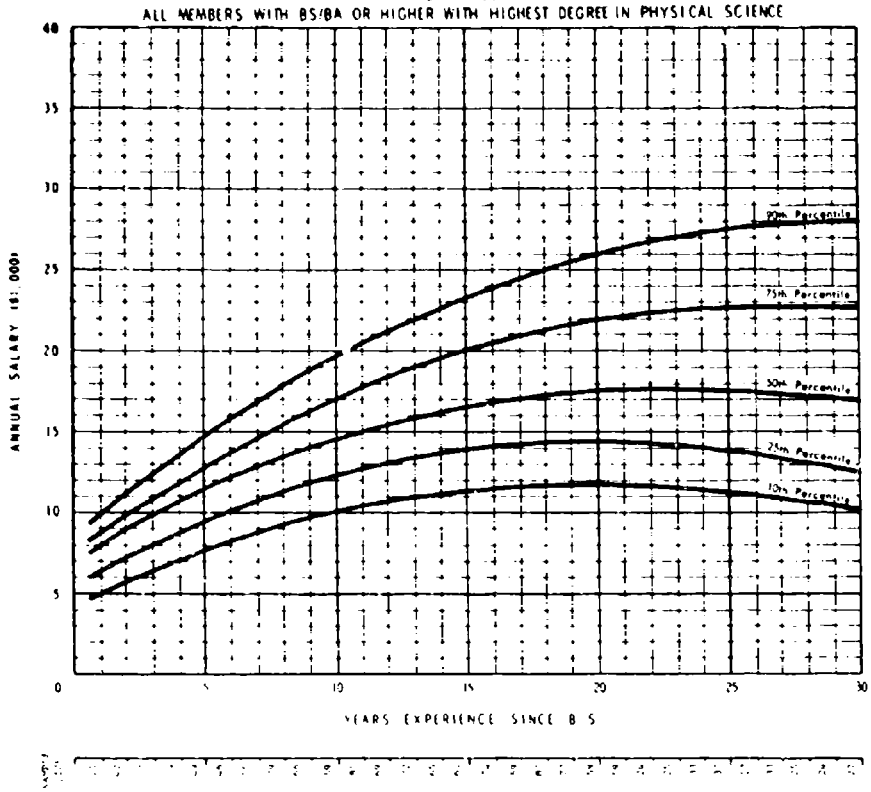
GRAPH 30

ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN BIO-MEDICAL FIELD



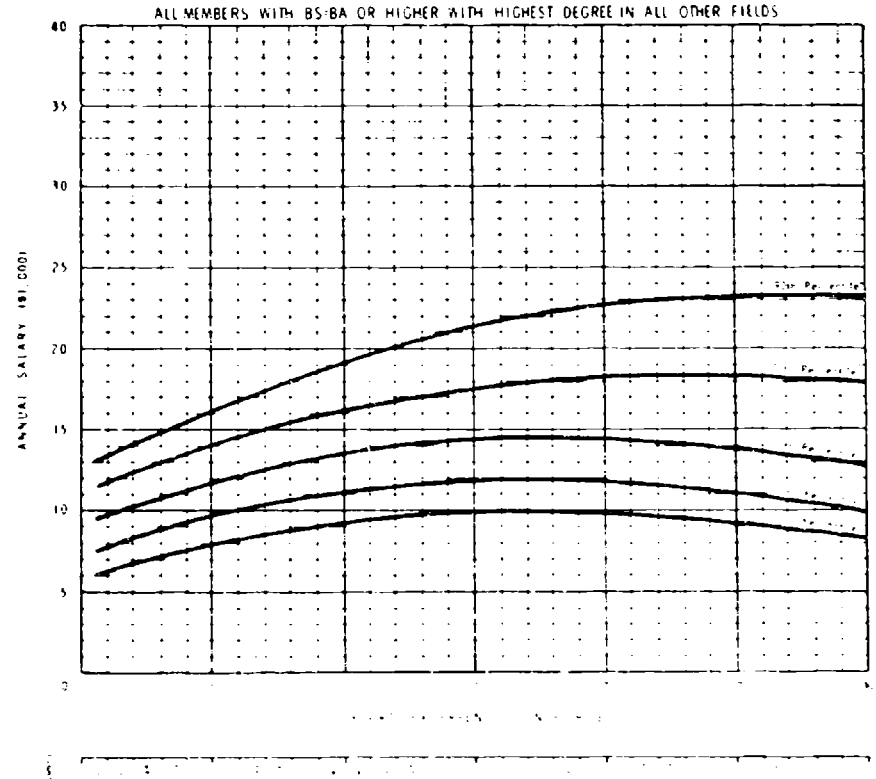
GRAPH 31

ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN PHYSICAL SCIENCE

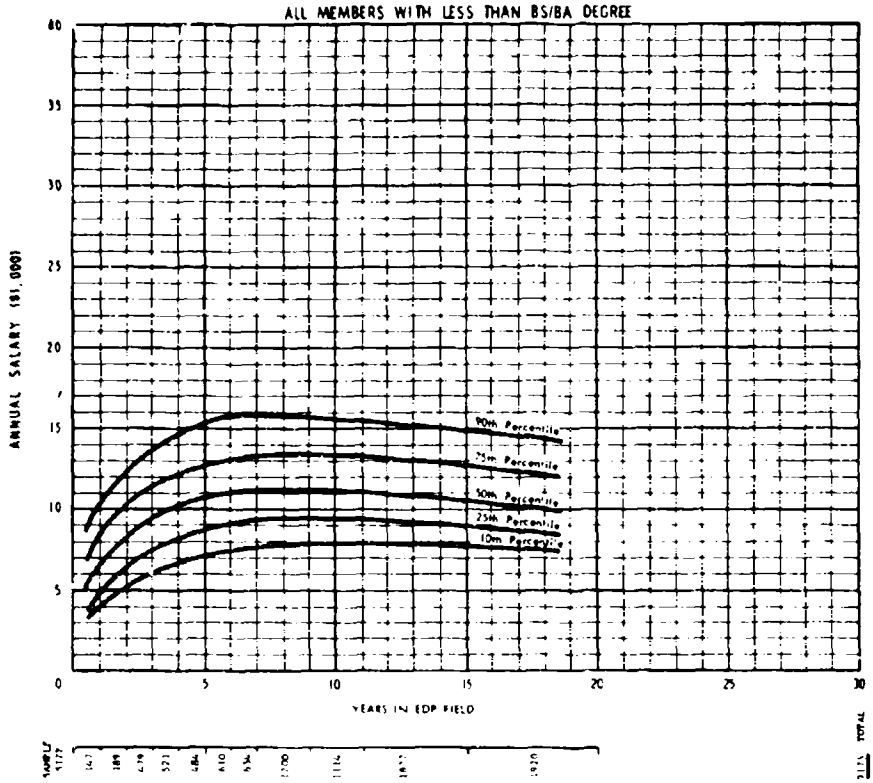


GRAPH 32

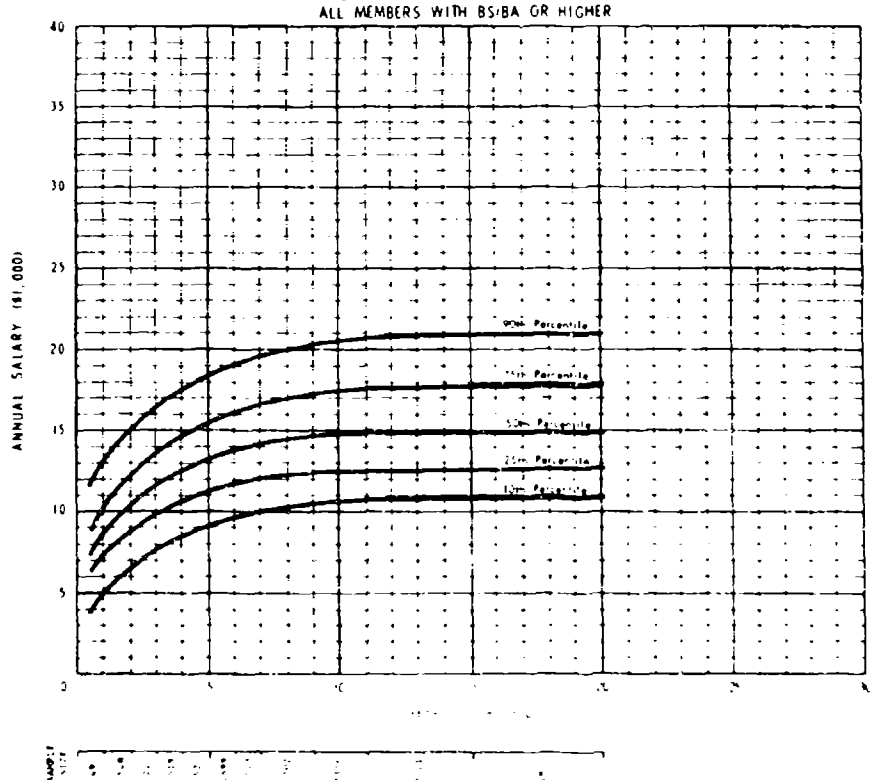
ALL MEMBERS WITH BS/BA OR HIGHER WITH HIGHEST DEGREE IN ALL OTHER FIELDS



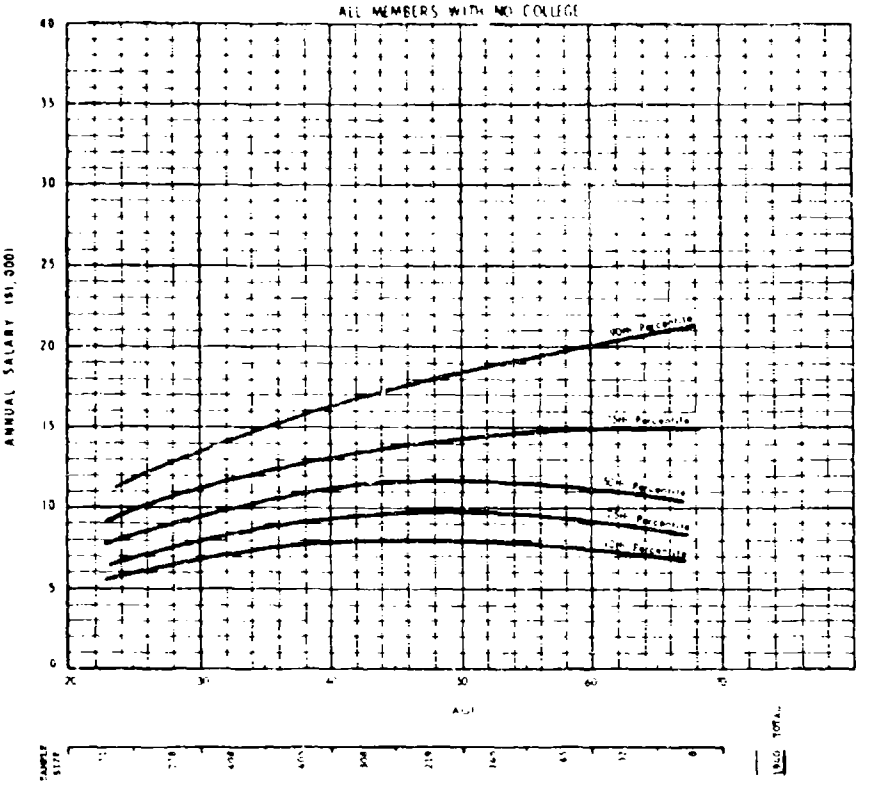
GRAPH 33
SALARY vs. YEARS IN E D P FIELD
ALL MEMBERS WITH LESS THAN BS/BA DEGREE



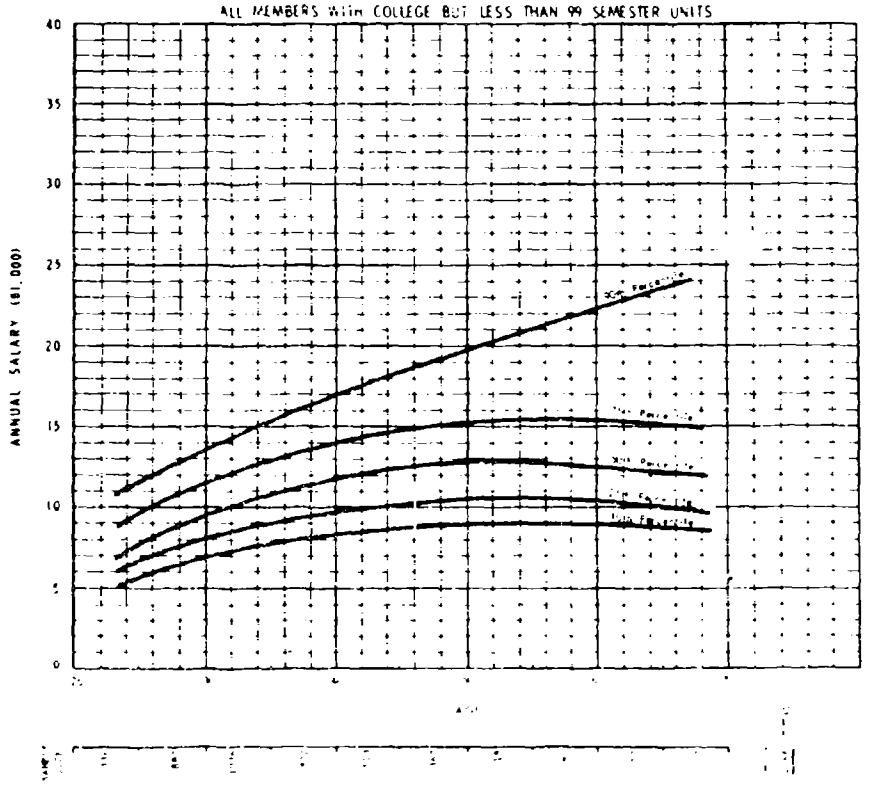
GRAPH 34
SALARY vs YEARS IN E D P FIELD
ALL MEMBERS WITH BS/BA OR HIGHER



GRAPH 3a
SALARY vs. AGE
ALL MEMBERS WITH NO COLLEGE



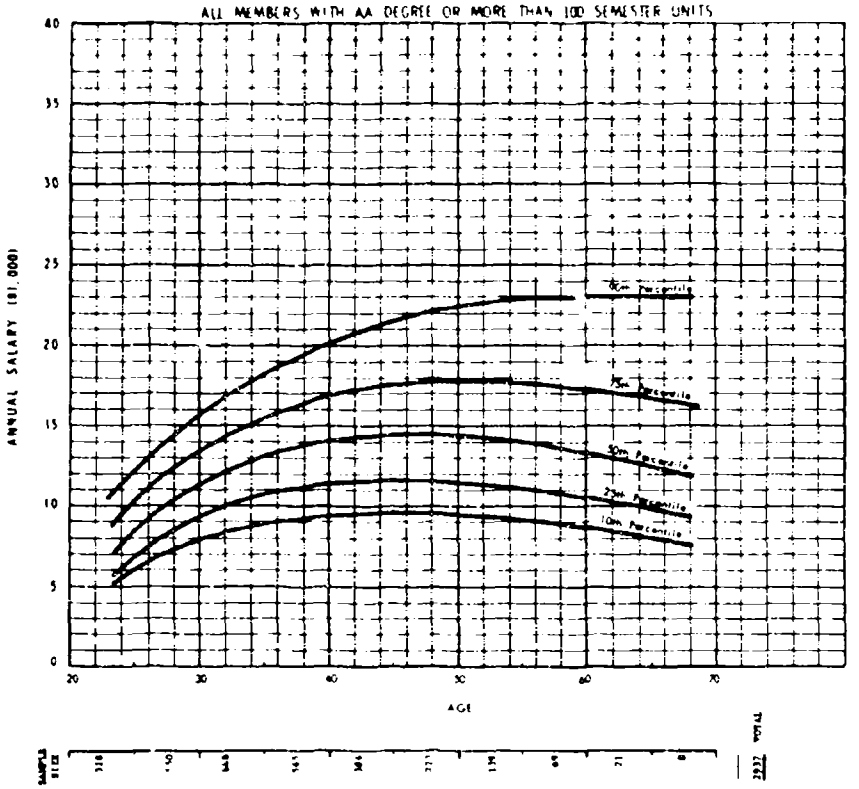
GRAPH 3b
SALARY vs. AGE
ALL MEMBERS With COLLEGE BUT LESS THAN 99 SEMESTER UNITS



GRAPH 37

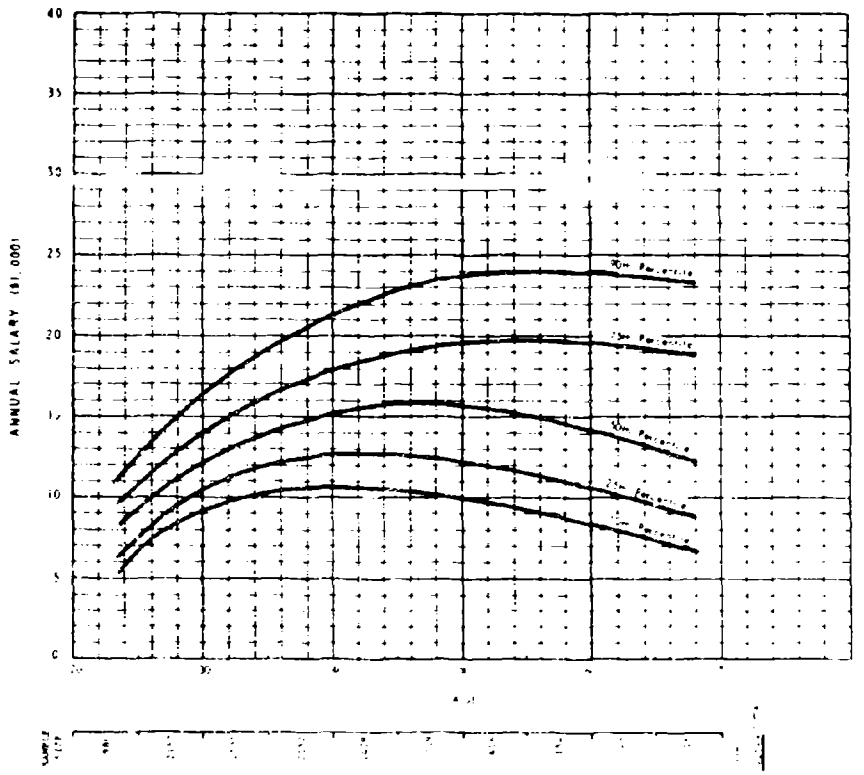
SALARY vs AGE

ALL MEMBERS WITH AA DEGREE OR MORE THAN 100 SEMESTER UNITS

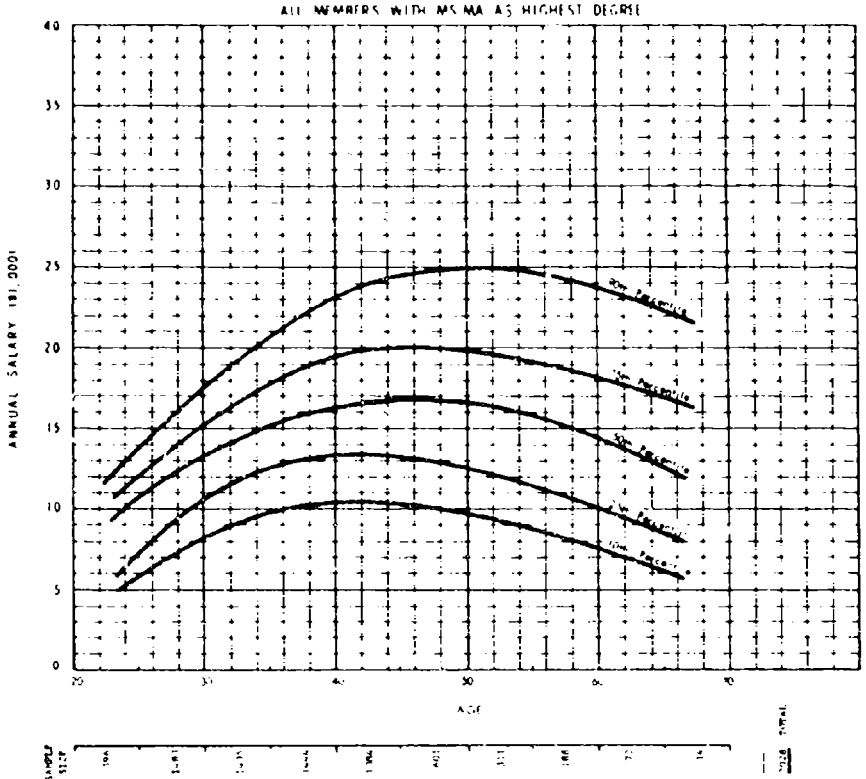


GRAPH 38

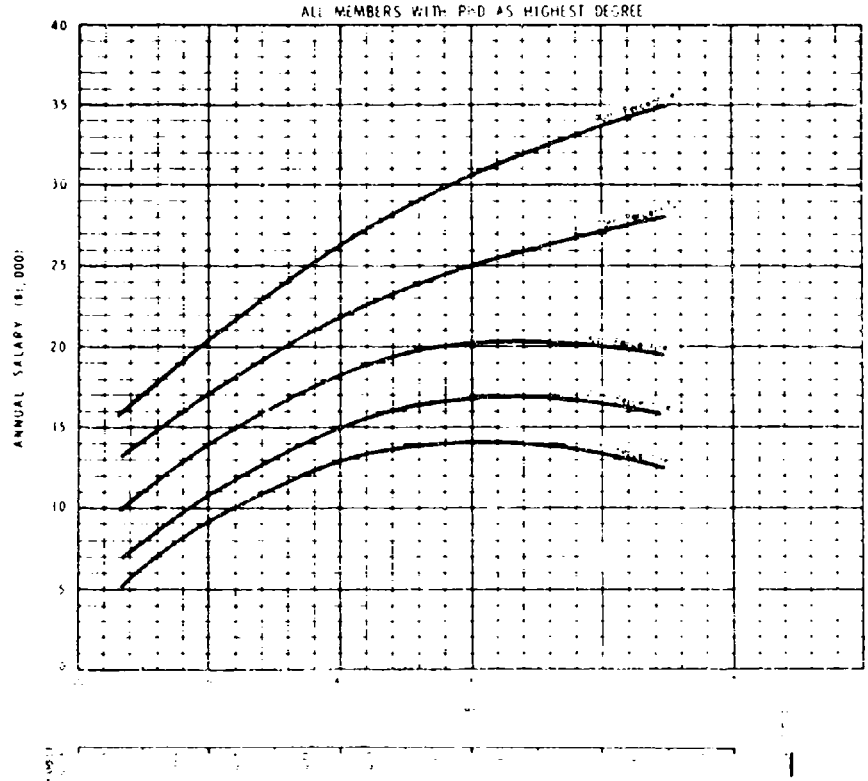
ALL MEMBERS WITH BS/BA AS HIGHEST DEGREE



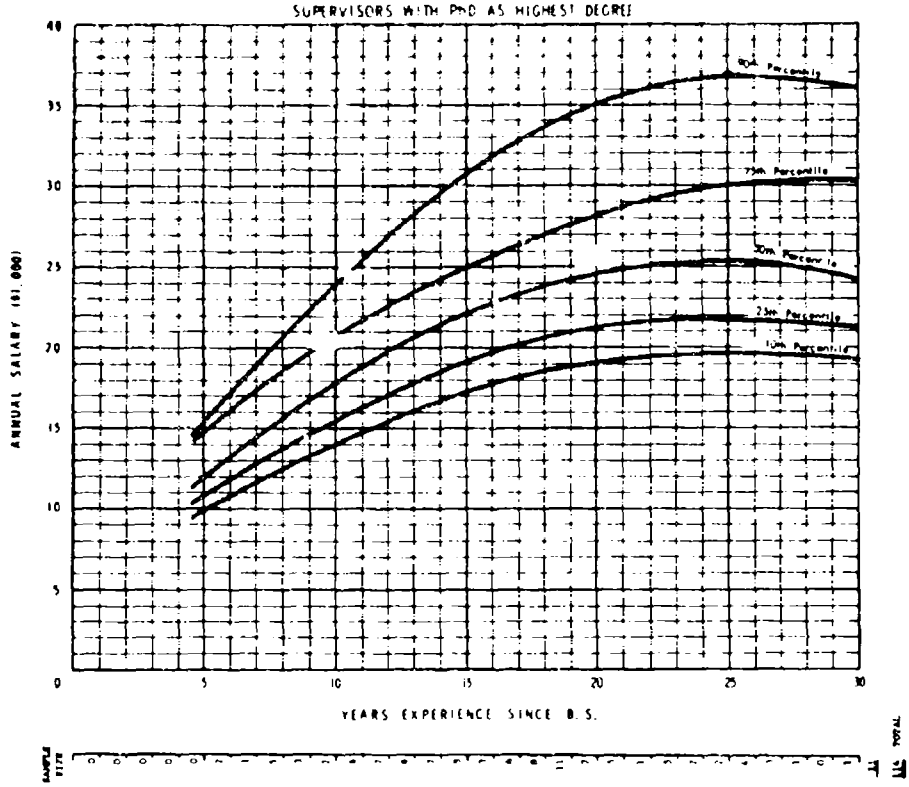
GRAPH 39
SALARY vs AGE
ALL MEMBERS WITH MS/MA AS HIGHEST DEGREE



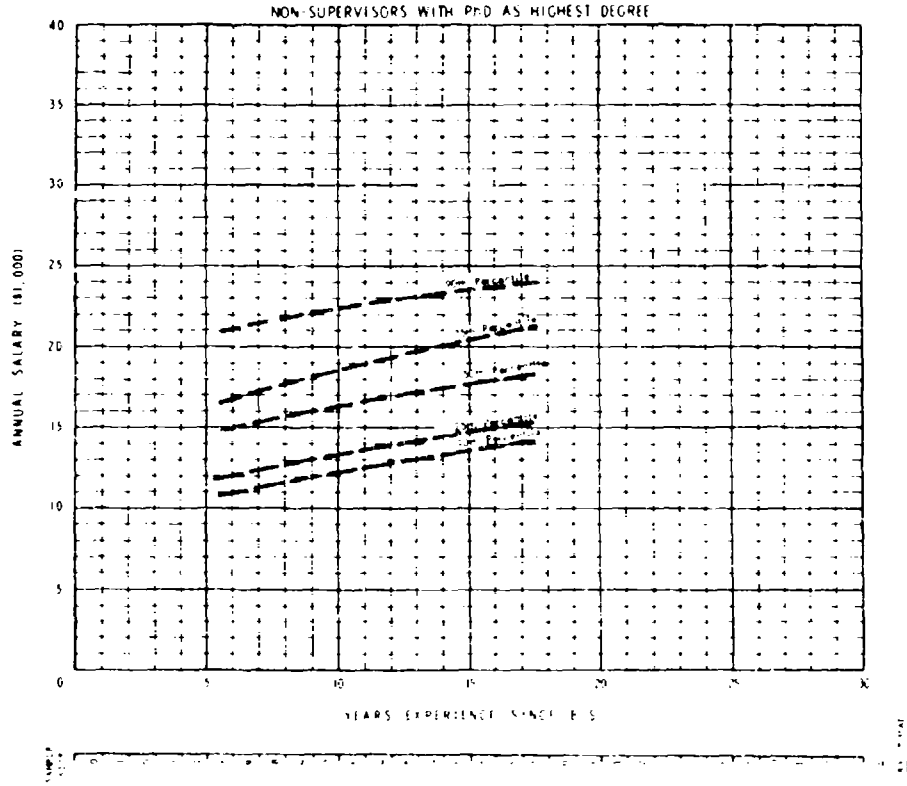
GRAPH 40
SALARY vs AGE
ALL MEMBERS WITH PhD AS HIGHEST DEGREE



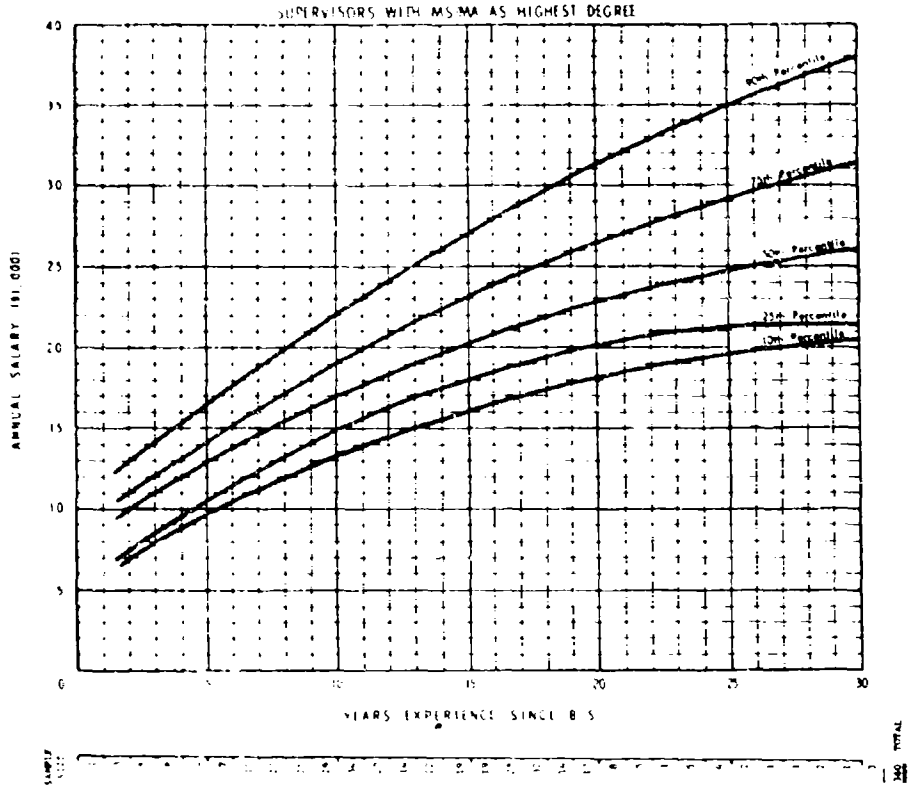
GRAPH 41 A
COMPUTER DESIGN
SUPERVISORS WITH PhD AS HIGHEST DEGREE



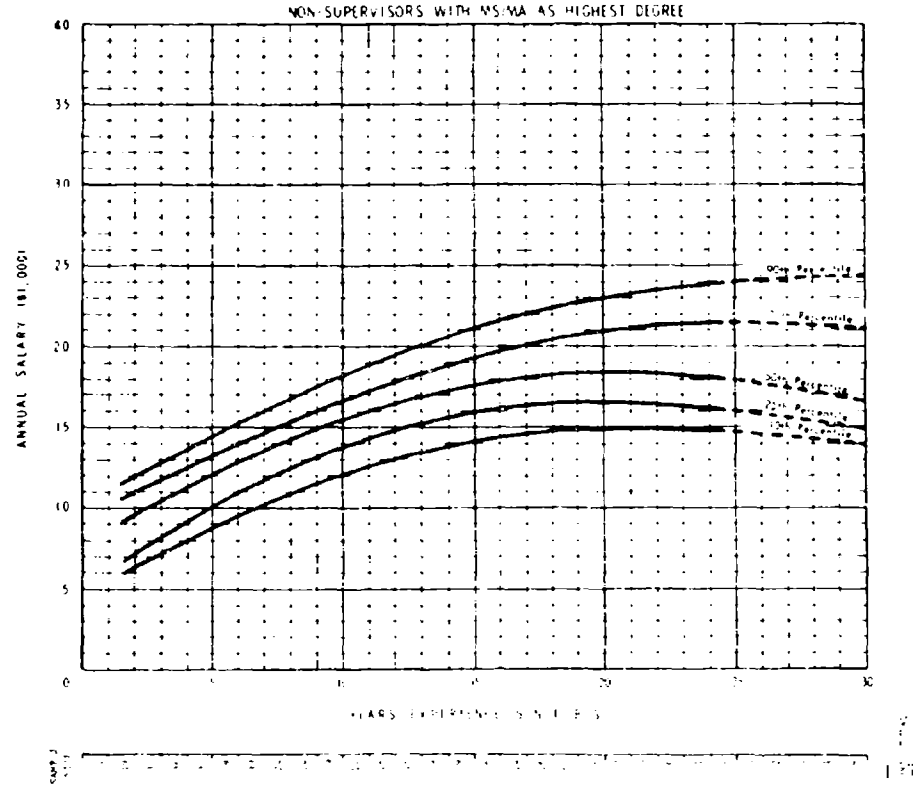
GRAPH 41 B
COMPUTER DESIGN
NON-SUPERVISORS WITH PhD AS HIGHEST DEGREE



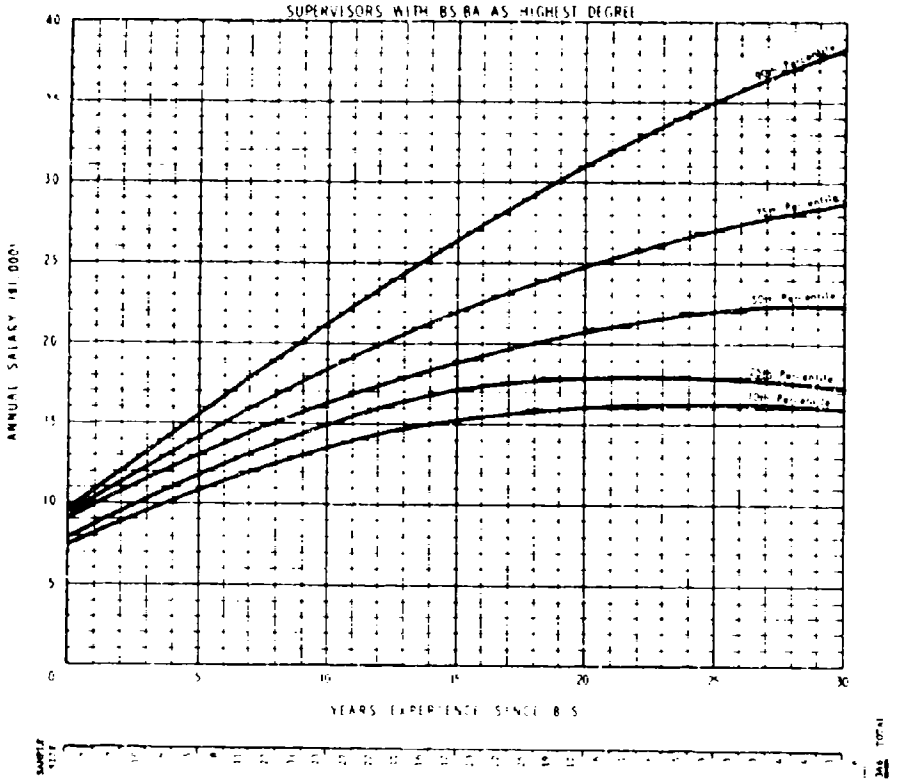
GRAPH 41 C
COMPUTER DESIGN
SUPERVISORS WITH MS/MA AS HIGHEST DEGREE



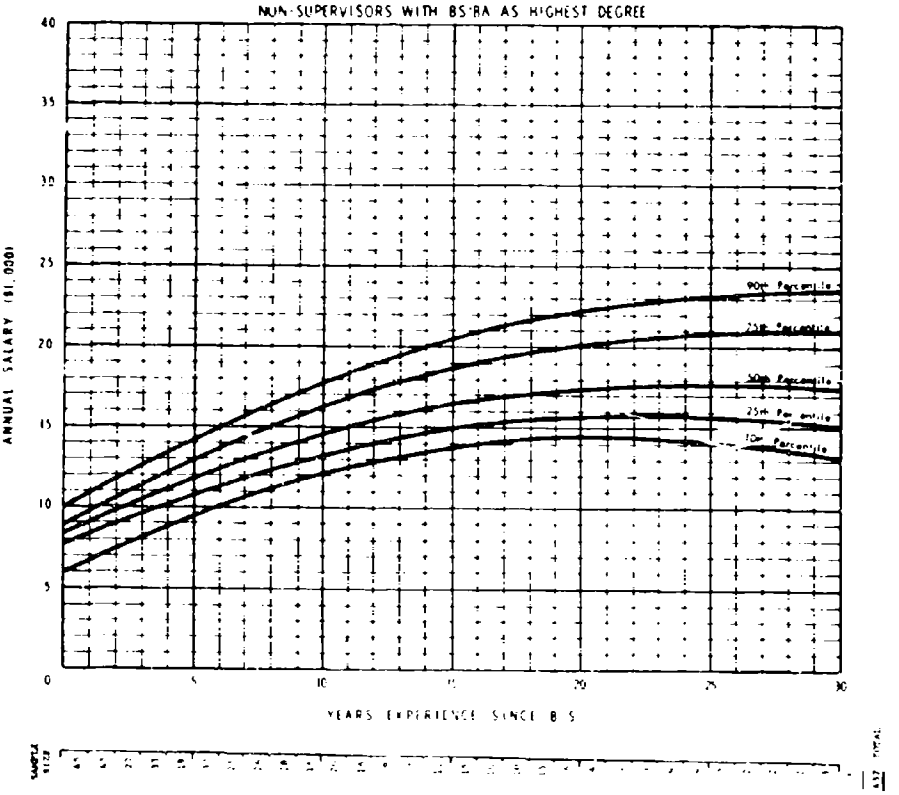
GRAPH 41 D
COMPUTER DESIGN
NON-SUPERVISORS WITH MS/MA AS HIGHEST DEGREE



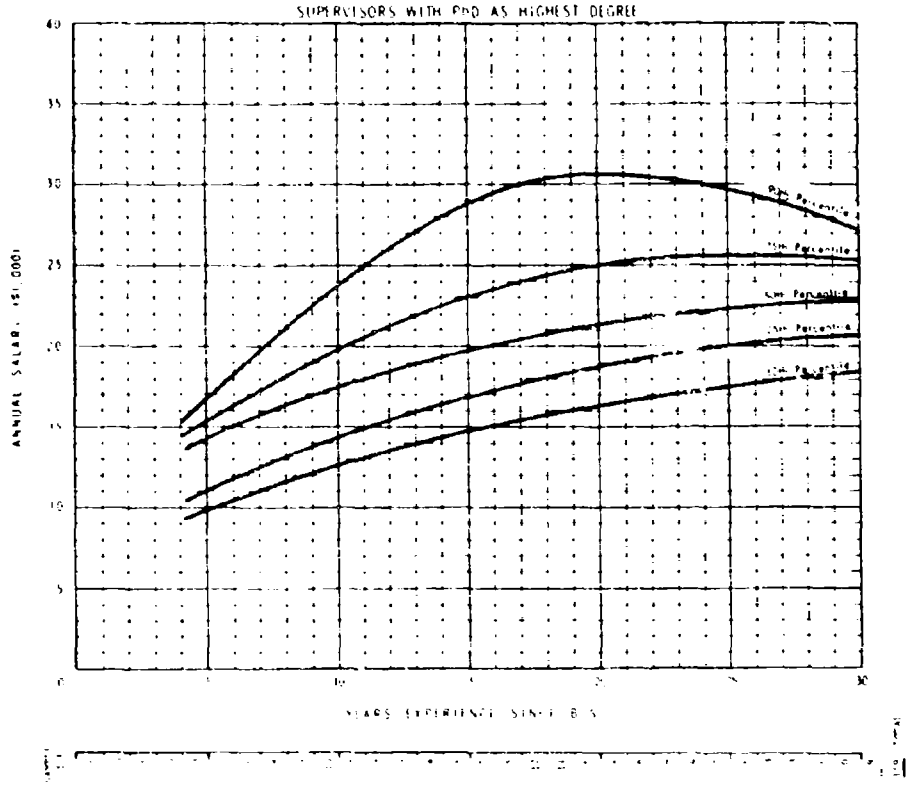
GRAPH 41 E
COMPUTER DESIGN
SUPERVISORS WITH BS/BA AS HIGHEST DEGREE



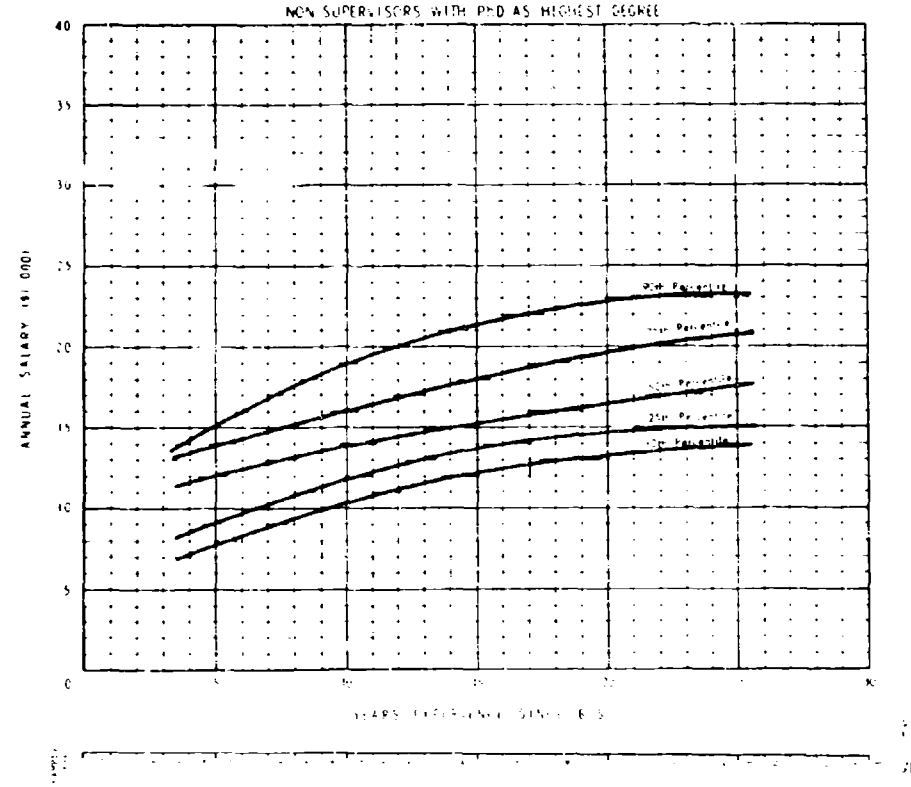
GRAPH 41 F
COMPUTER DESIGN
NON-SUPERVISORS WITH BS/BA AS HIGHEST DEGREE



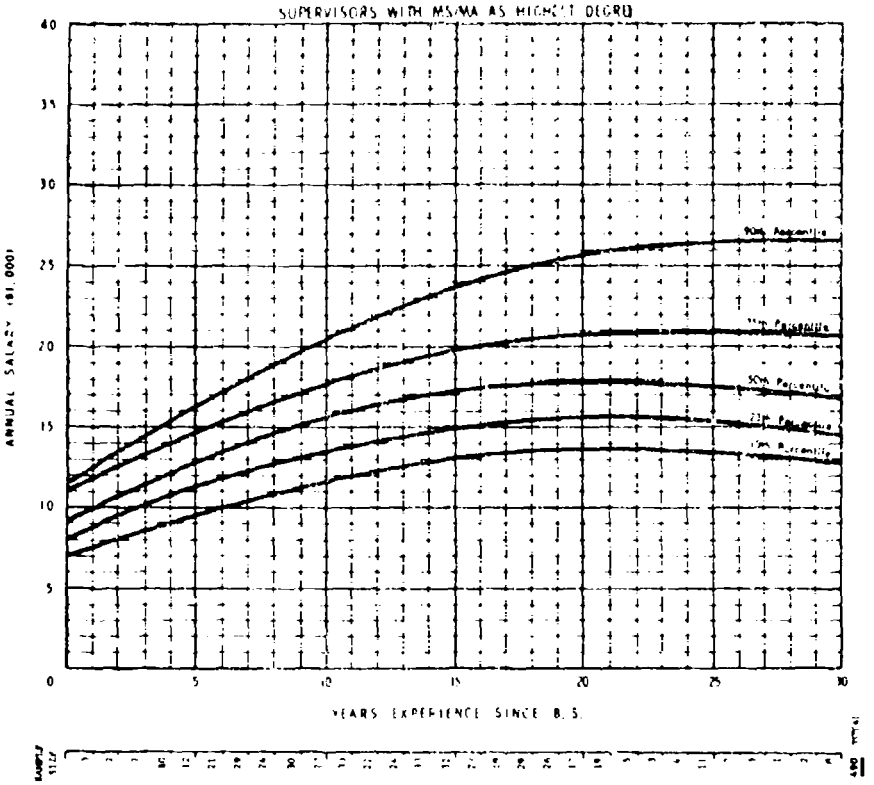
GRAPH 42 A
APPLICATIONS PROGRAMMER
SUPERVISORS WITH PhD AS HIGHEST DEGREE



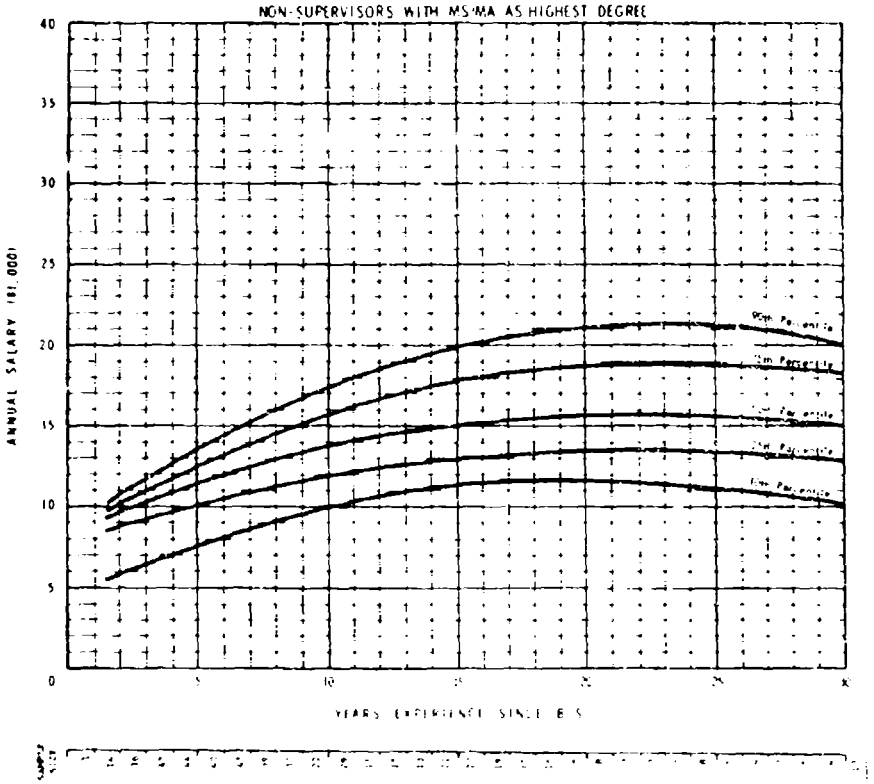
GRAPH 42 B
APPLICATIONS PROGRAMMER
NON SUPERVISORS WITH PhD AS HIGHEST DEGREE



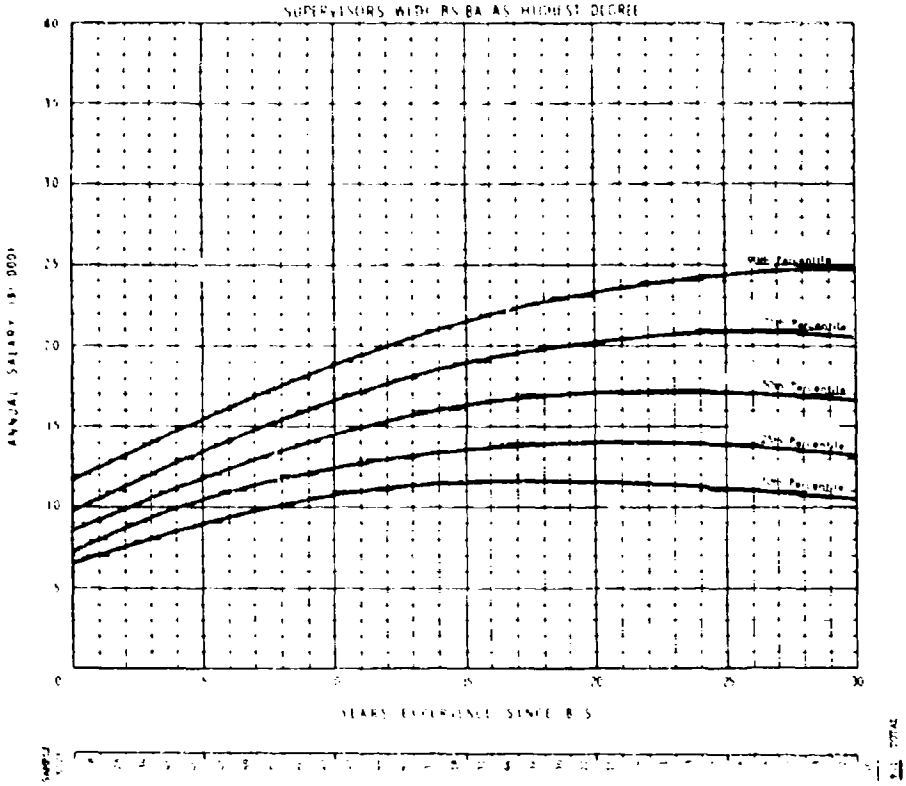
GRAPH 42 C
APPLICATIONS PROGRAMMER
SUPERVISORS WITH MS/MA AS HIGHEST DEGREE



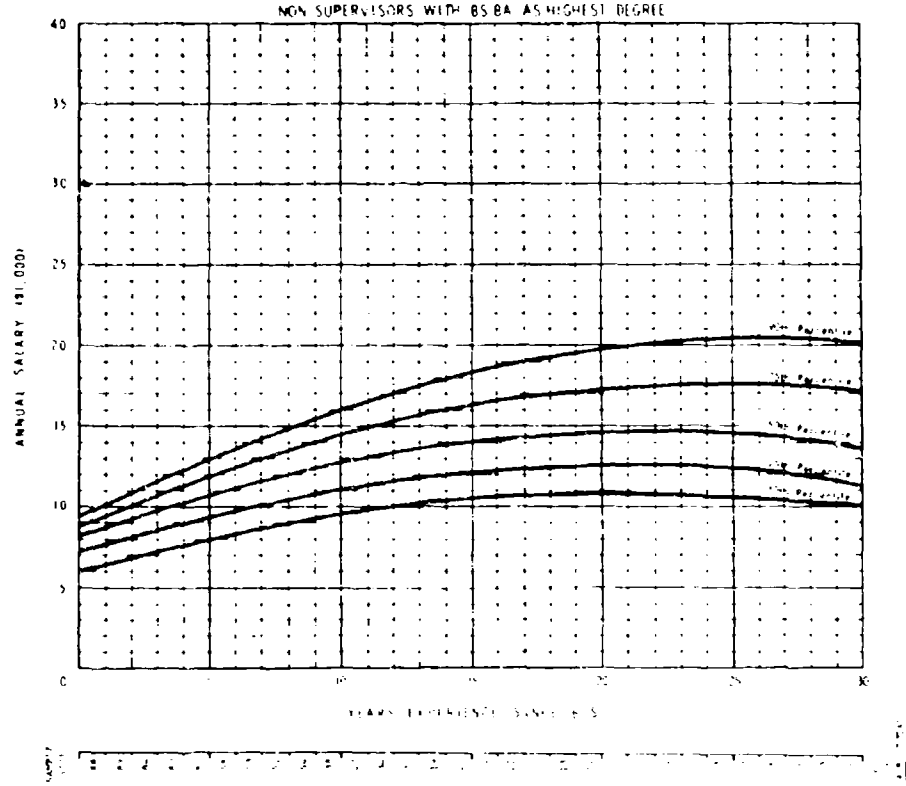
GRAPH 42 D
APPLICATIONS PROGRAMMER
NON-SUPERVISORS WITH MS/MA AS HIGHEST DEGREE

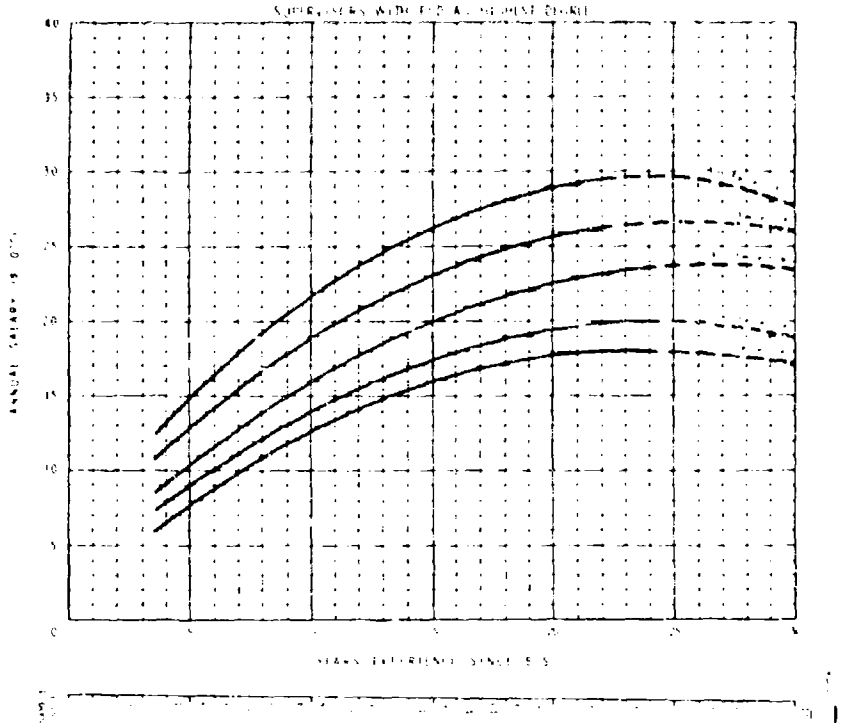


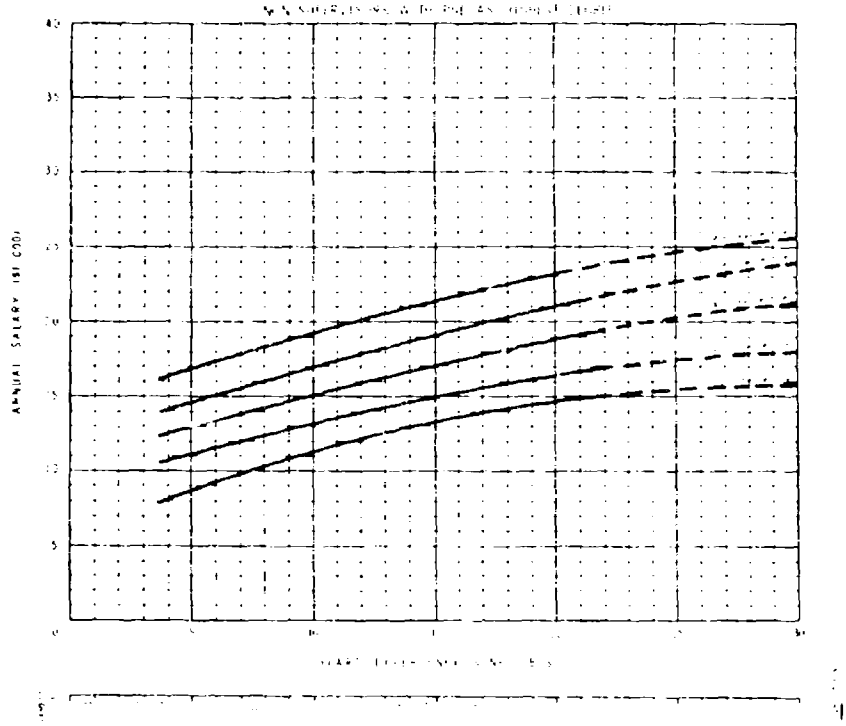
GRAPH 41
APPLICATIONS PROGRAMMER
SUPERVISORS WITH BS BA AS HIGHEST DEGREE



GRAPH 42F
APPLICATIONS PROGRAMMER
NON SUPERVISORS WITH BS BA AS HIGHEST DEGREE



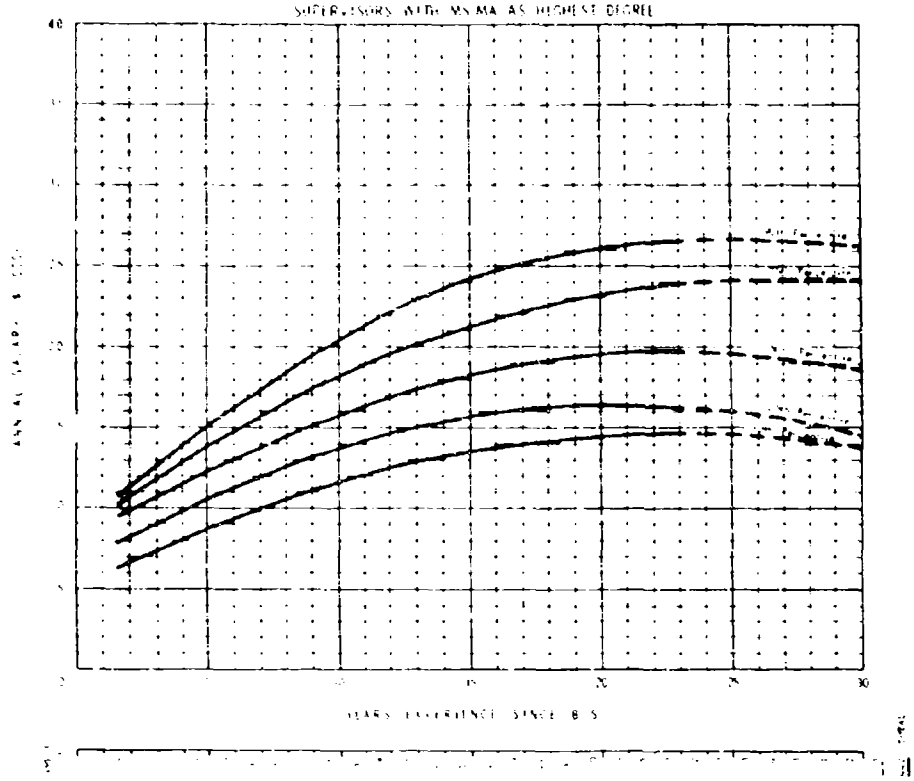




GRAPH 47a

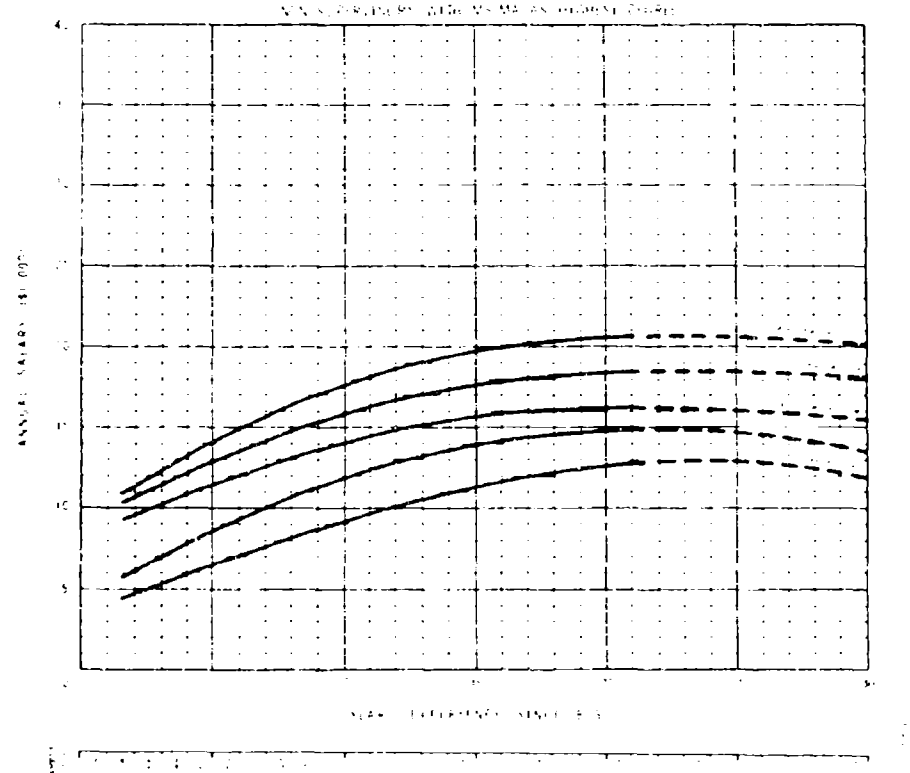
SYSTEMS PROGRAMMING PROGRAMMING RESEARCH

SUPERVISORS WITH MS/MA AS HIGHEST DEGREE



GRAPH 47b

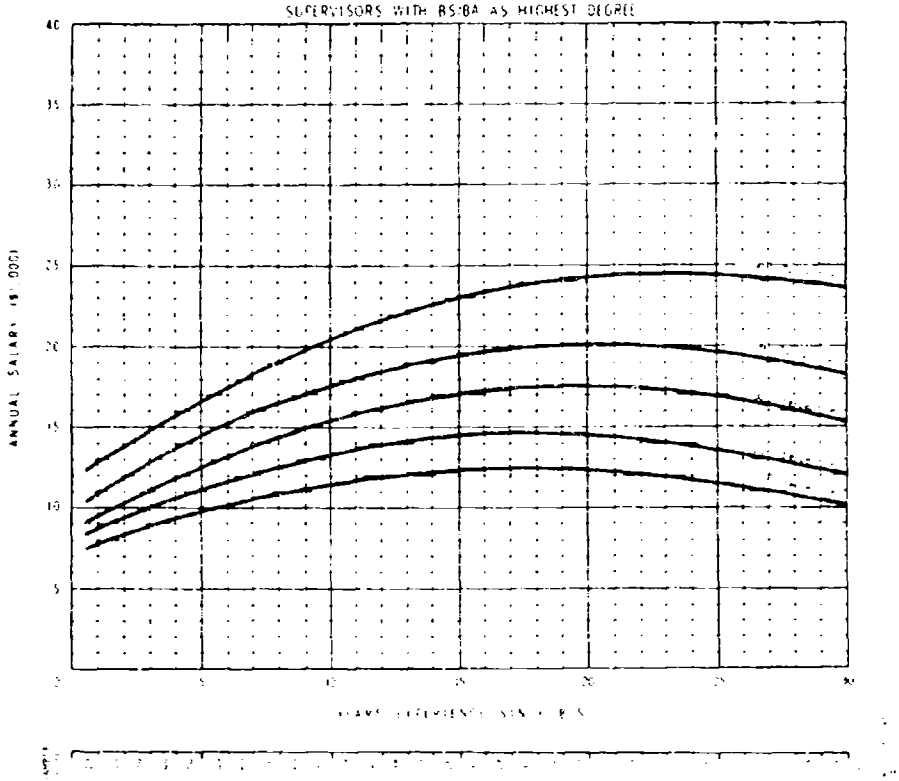
SYSTEMS PROGRAMMING PROGRAMMING RESEARCH

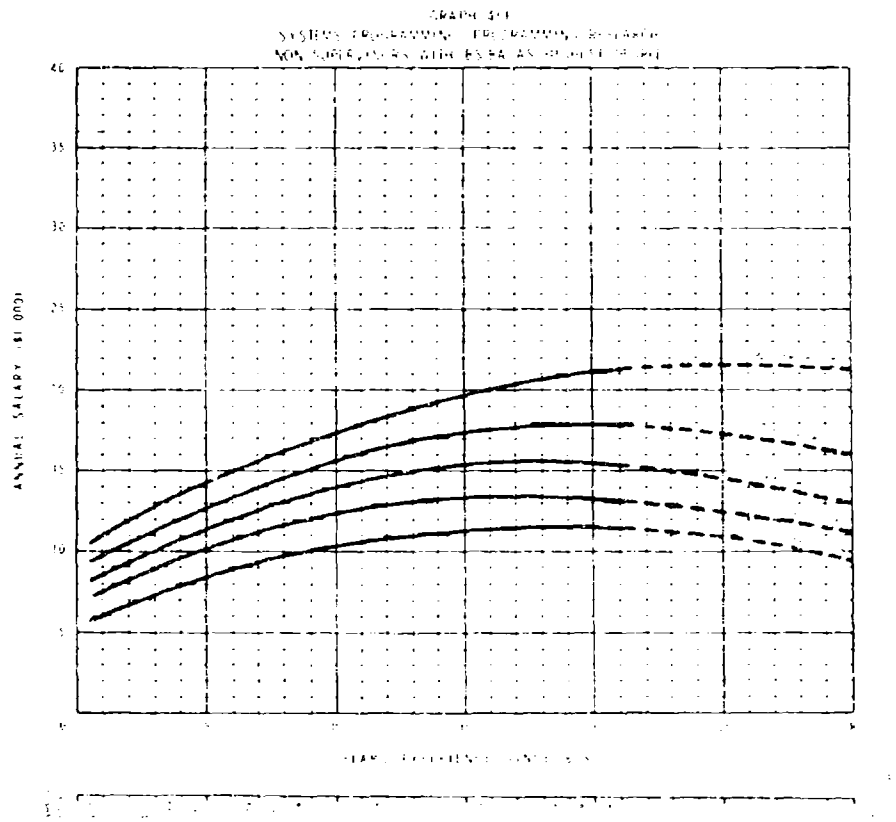


GRAPH 43E

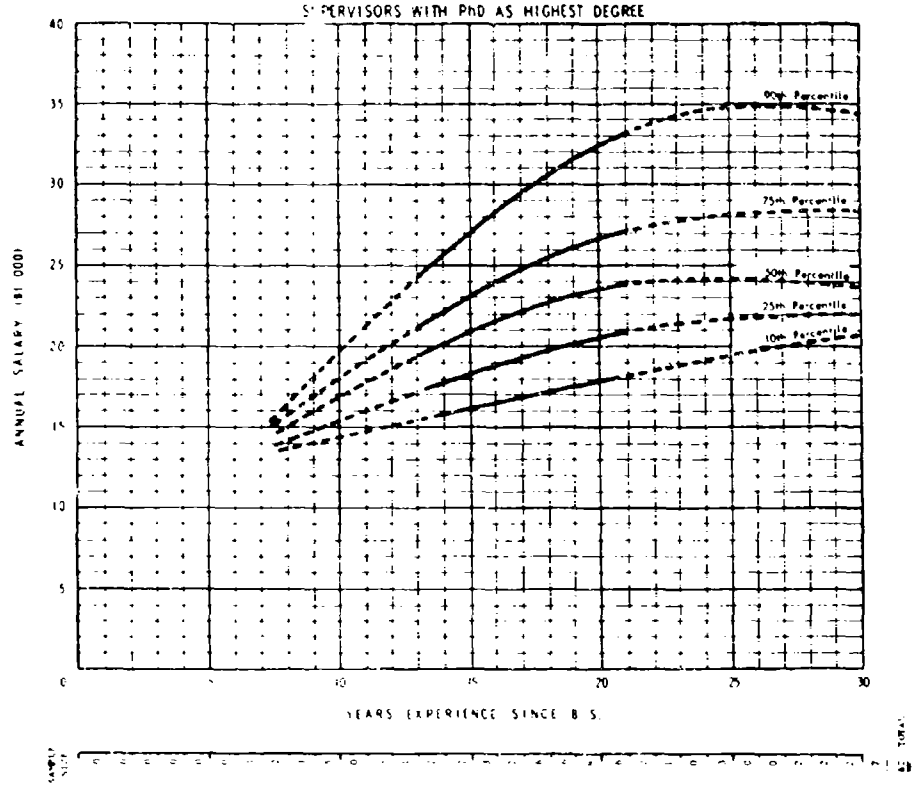
SYSTEMS PROGRAMMING PROGRAMMING RESEARCH

SUPERVISORS WITH BS/BA AS HIGHEST DEGREE

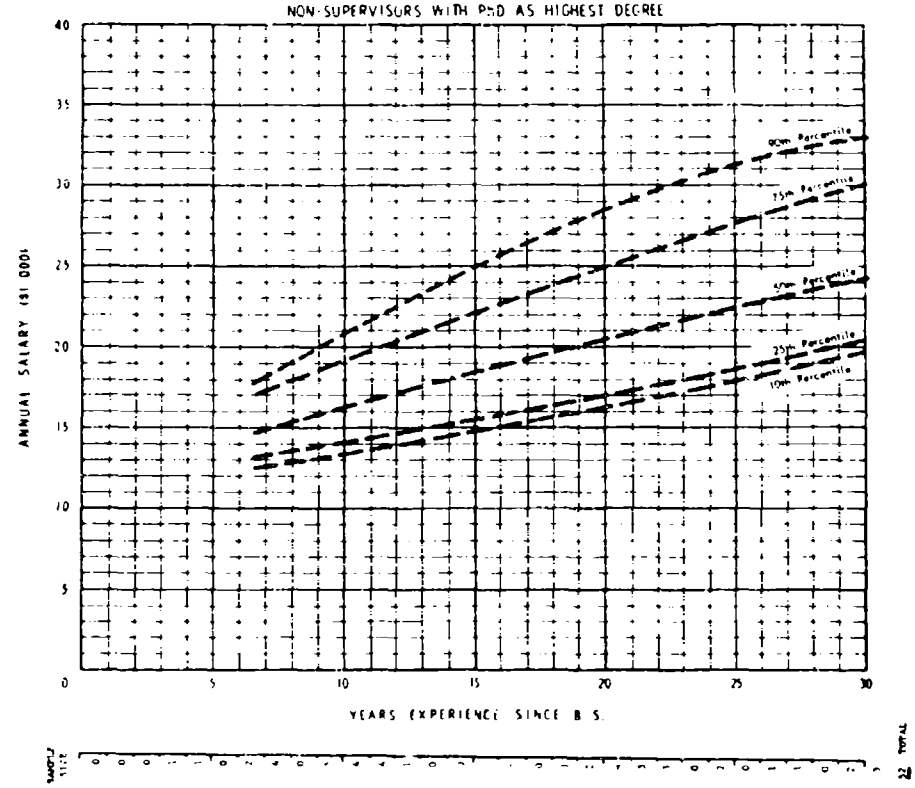




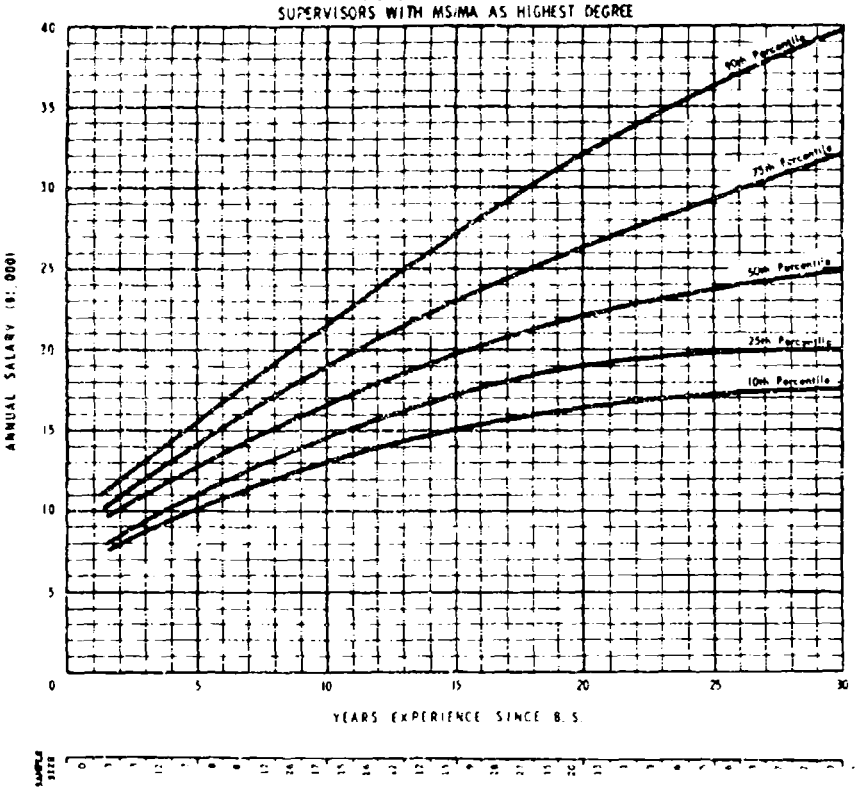
GRAPH 44 A
SYSTEMS ENGINEERING / DESIGN
SUPERVISORS WITH PhD AS HIGHEST DEGREE



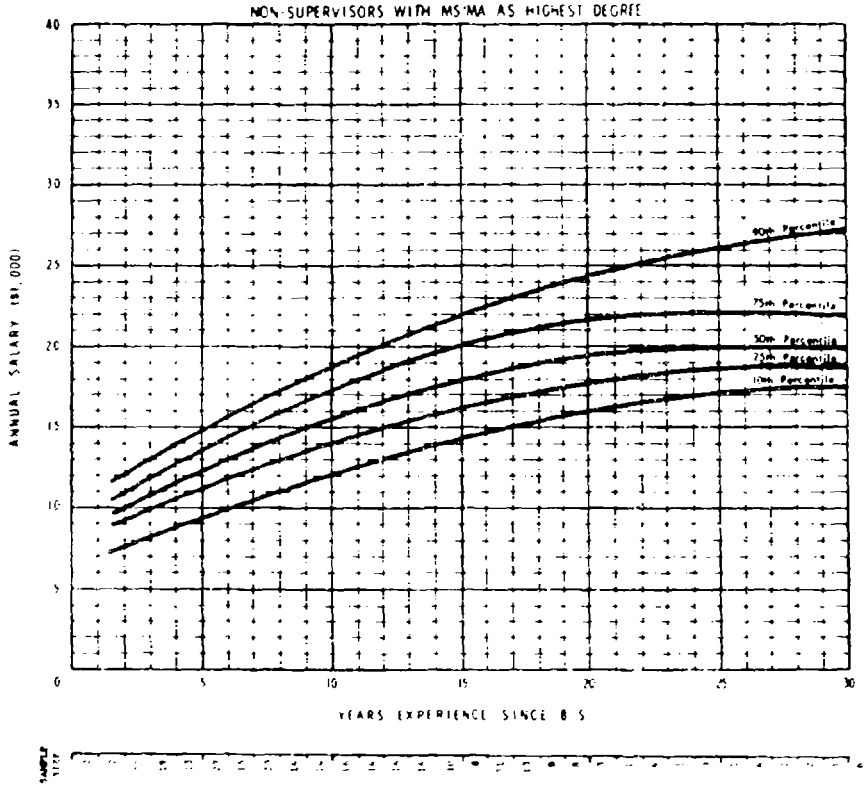
GRAPH 44 B
SYSTEMS ENGINEERING / DESIGN
NON-SUPERVISORS WITH PhD AS HIGHEST DEGREE



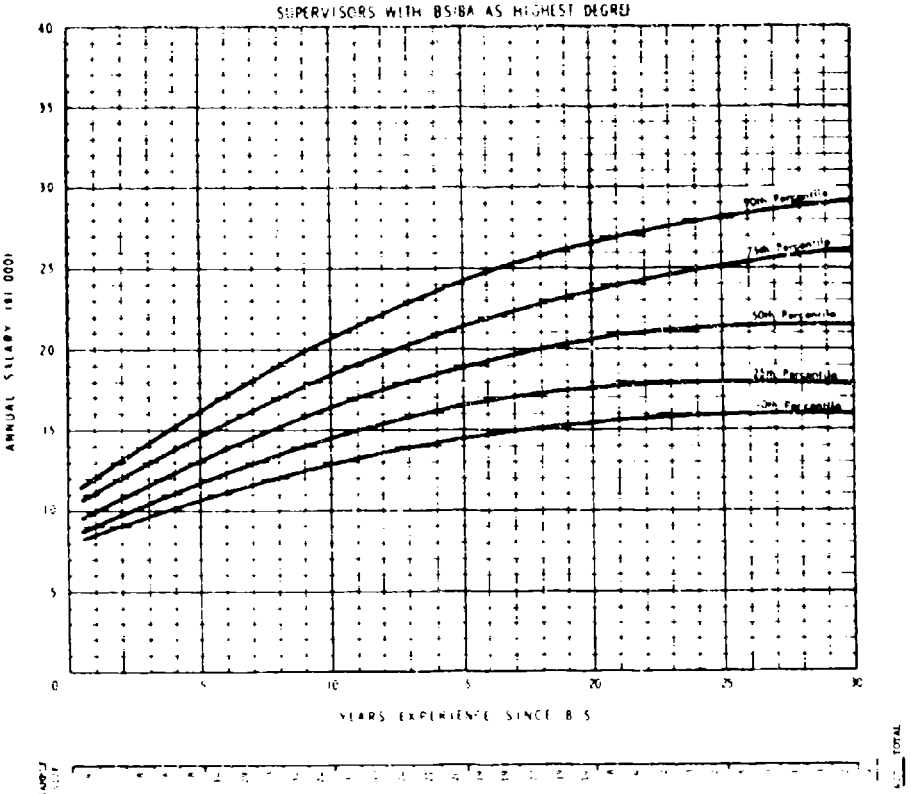
GRAPH 44 C
SYSTEMS ENGINEERING / DESIGN
SUPERVISORS WITH MS/MA AS HIGHEST DEGREE



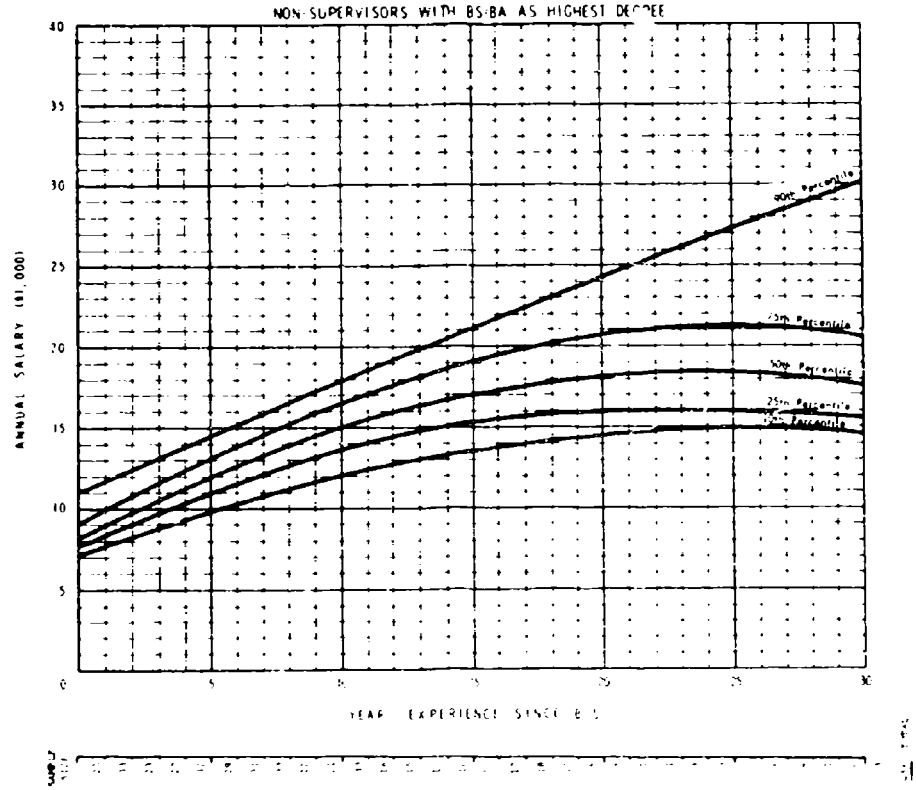
GRAPH 44 D
SYSTEMS ENGINEERING : DESIGN
NON-SUPERVISORS WITH MS/MA AS HIGHEST DEGREE



GRAPH 44 E
SYSTEMS ENGINEERING DESIGN
SUPERVISORS WITH BS/BA AS HIGHEST DEGREE



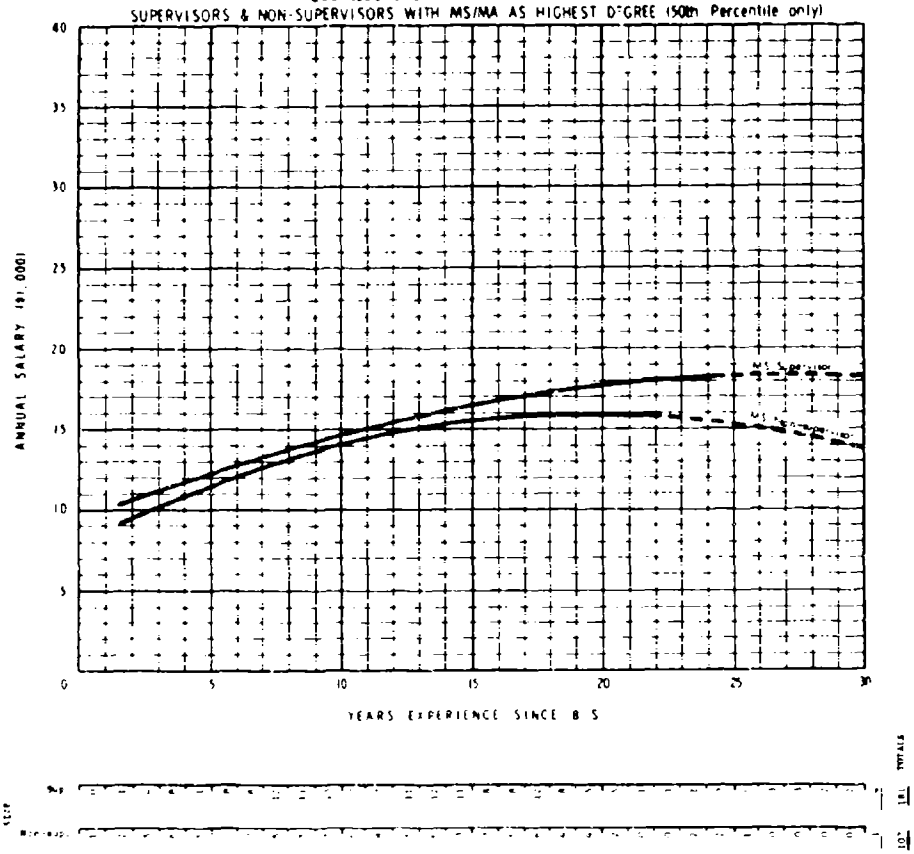
GRAPH 44 F
SYSTEMS ENGINEERING / DESIGN
NON-SUPERVISORS WITH BS/BA AS HIGHEST DEGREE



GRAPH 45 A

BUSINESS SYSTEMS / PROCEDURE ANALYSIS

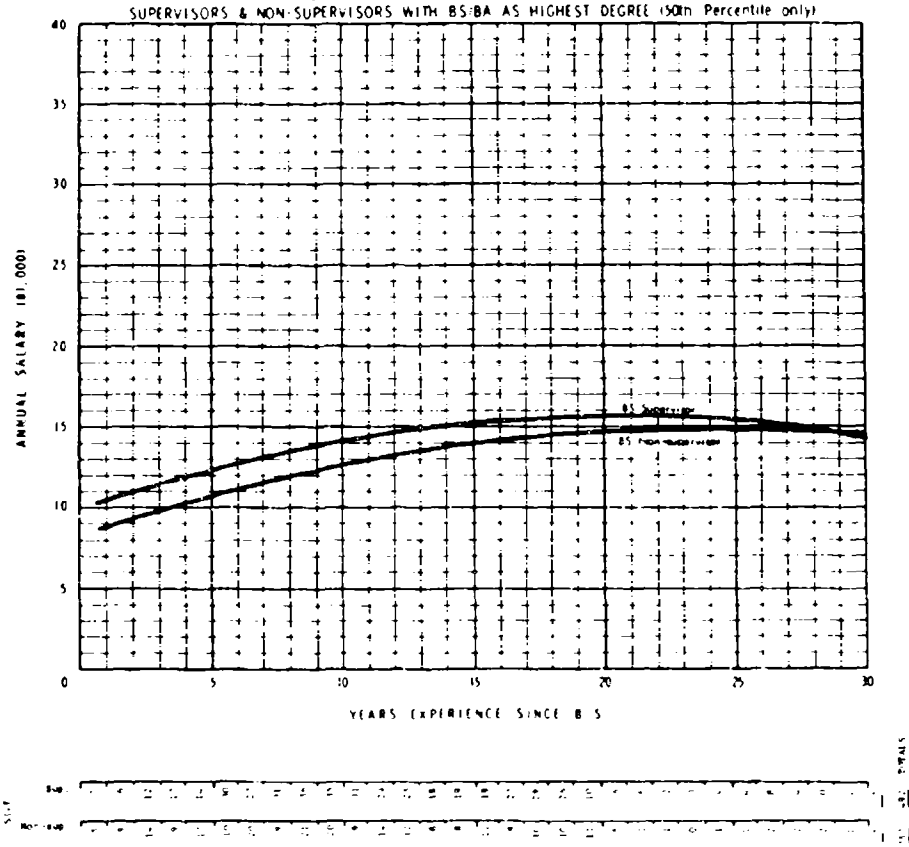
SUPERVISORS & NON-SUPERVISORS WITH MS/MA AS HIGHEST DEGREE (50th Percentile only)



GRAPH 45 B

BUSINESS SYSTEMS / PROCEDURE ANALYSIS

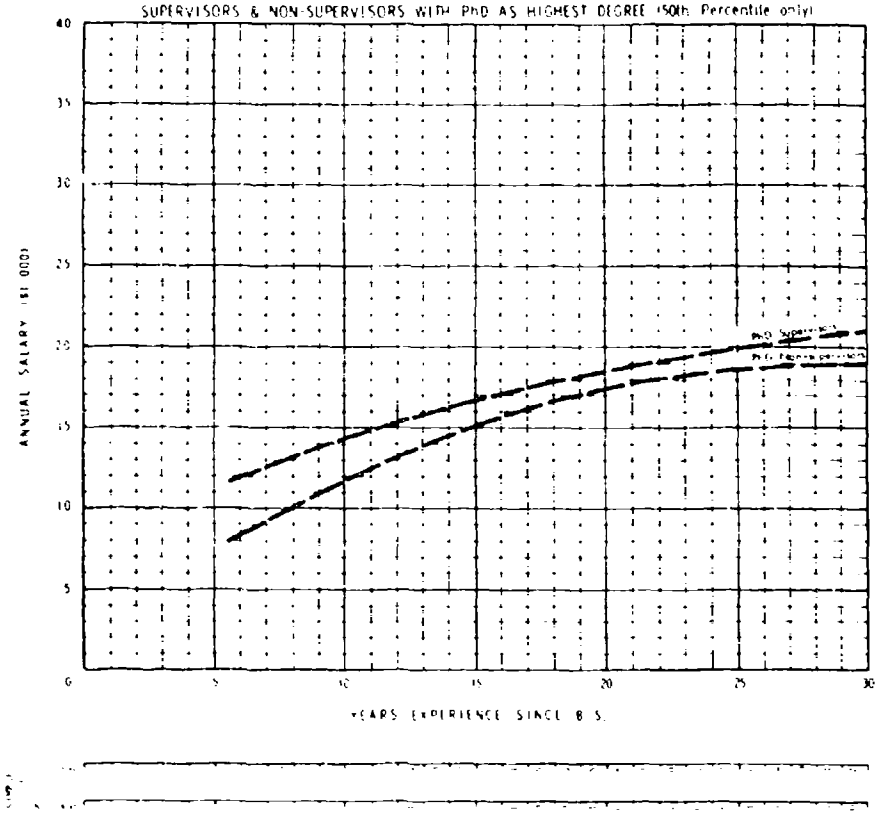
SUPERVISORS & NON-SUPERVISORS WITH BS/BA AS HIGHEST DEGREE (50th Percentile only)



GRAPH 46 A

LIBRARY : INFORMATION RETRIEVAL

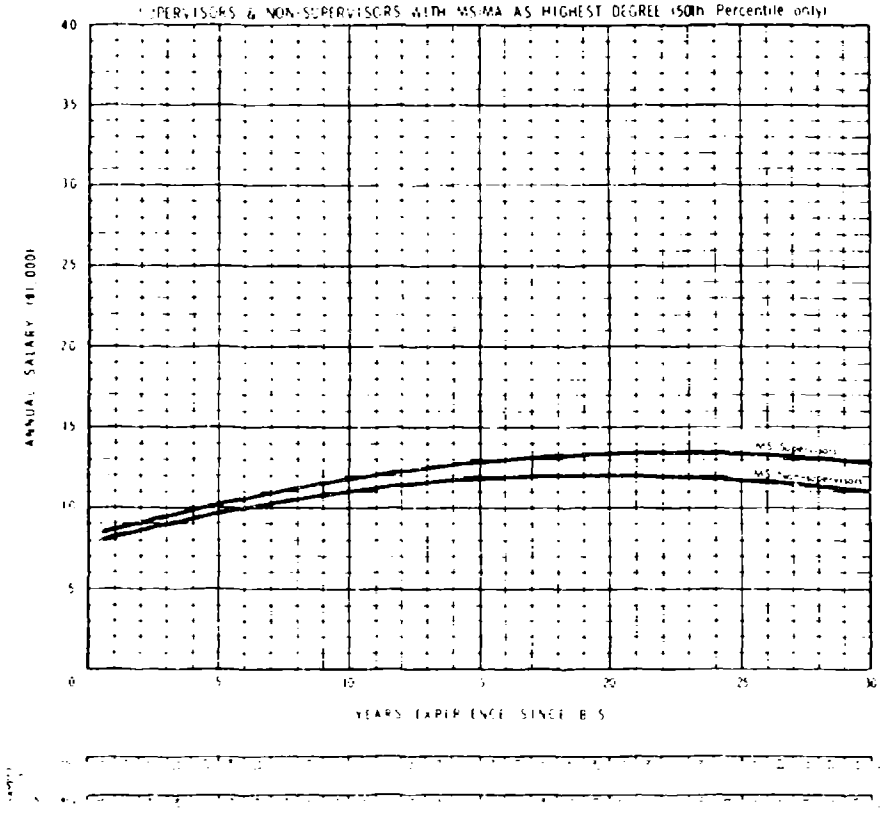
SUPERVISORS & NON-SUPERVISORS WITH PhD AS HIGHEST DEGREE (50th Percentile only)



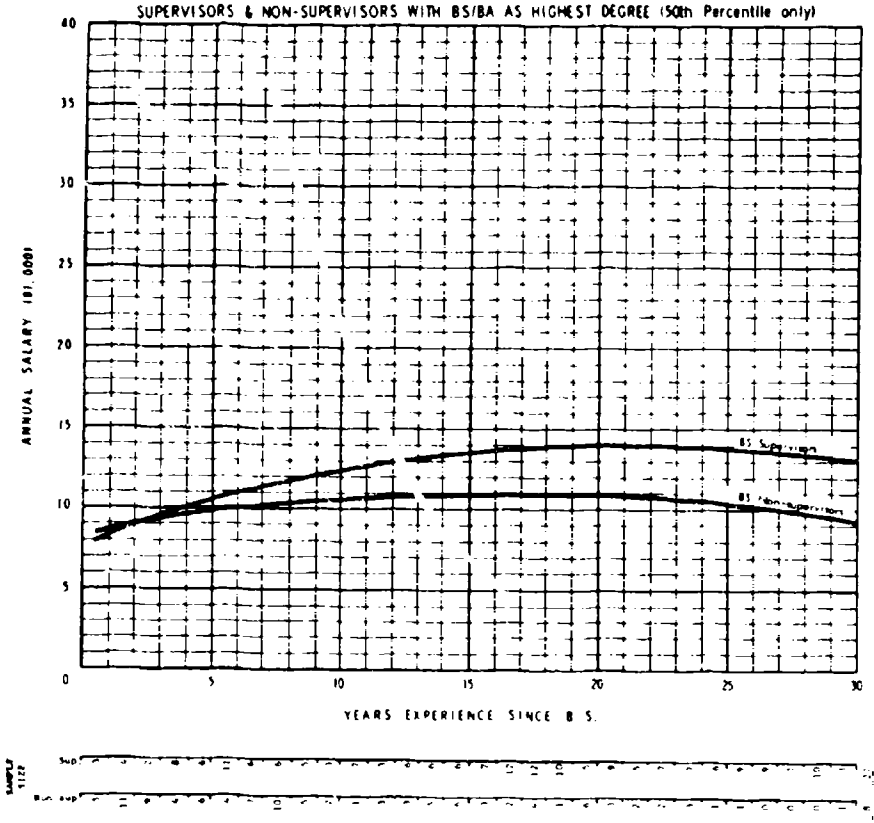
GRAPH 46 B

LIBRARY : INFORMATION RETRIEVAL

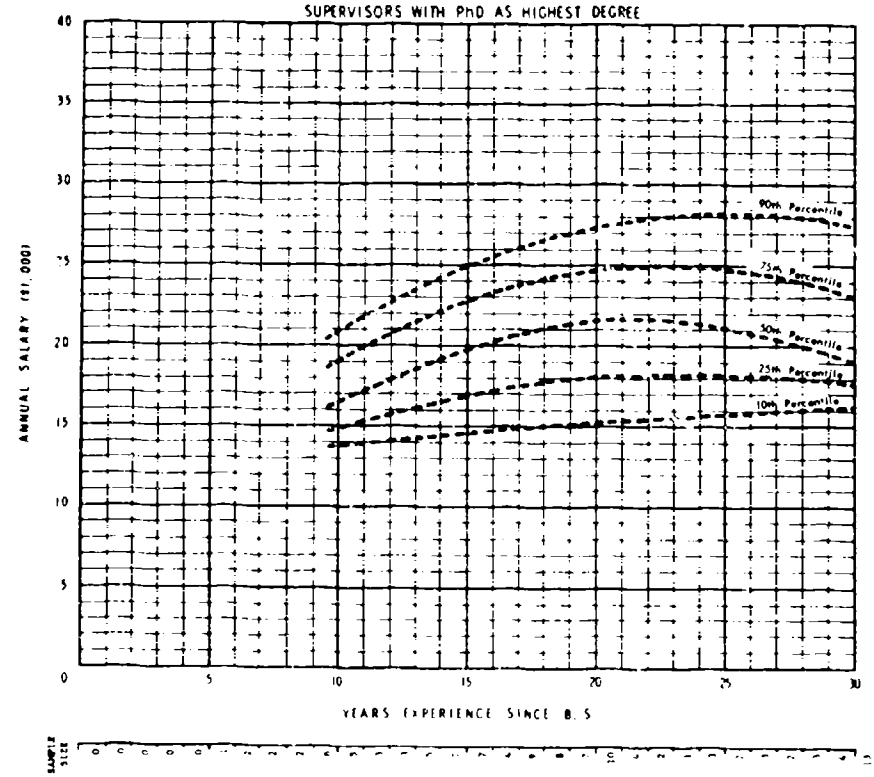
SUPERVISORS & NON-SUPERVISORS WITH MS/MA AS HIGHEST DEGREE (50th Percentile only)



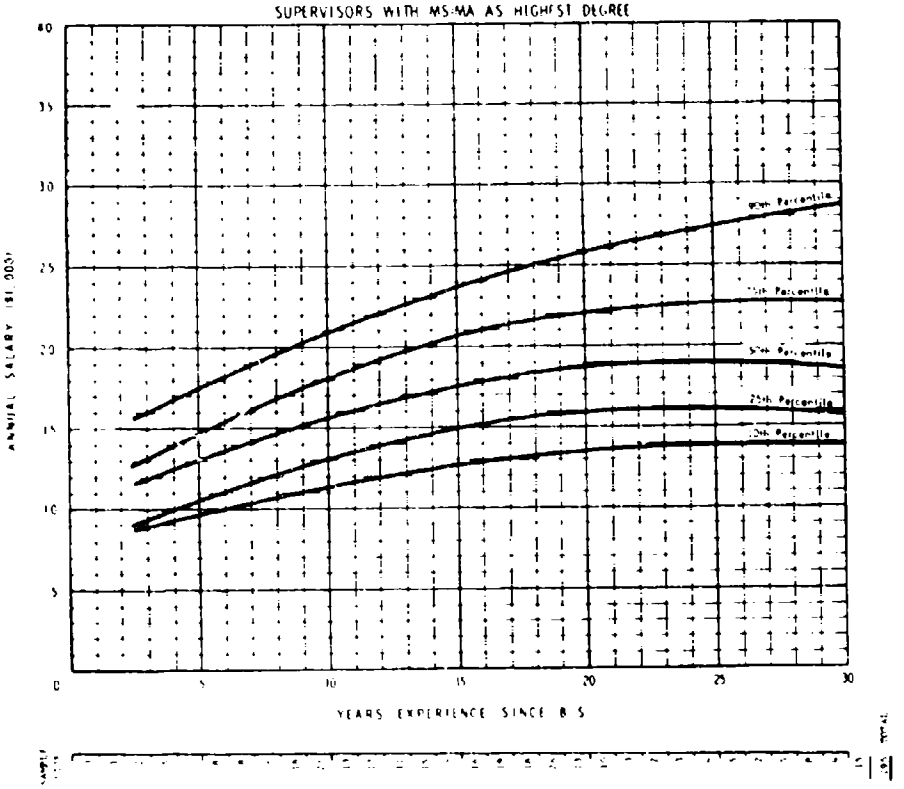
GRAPH 46 C
LIBRARY / INFORMATION RETRIEVAL
SUPERVISORS & NON-SUPERVISORS WITH BS/BA AS HIGHEST DEGREE (50th Percentile only)



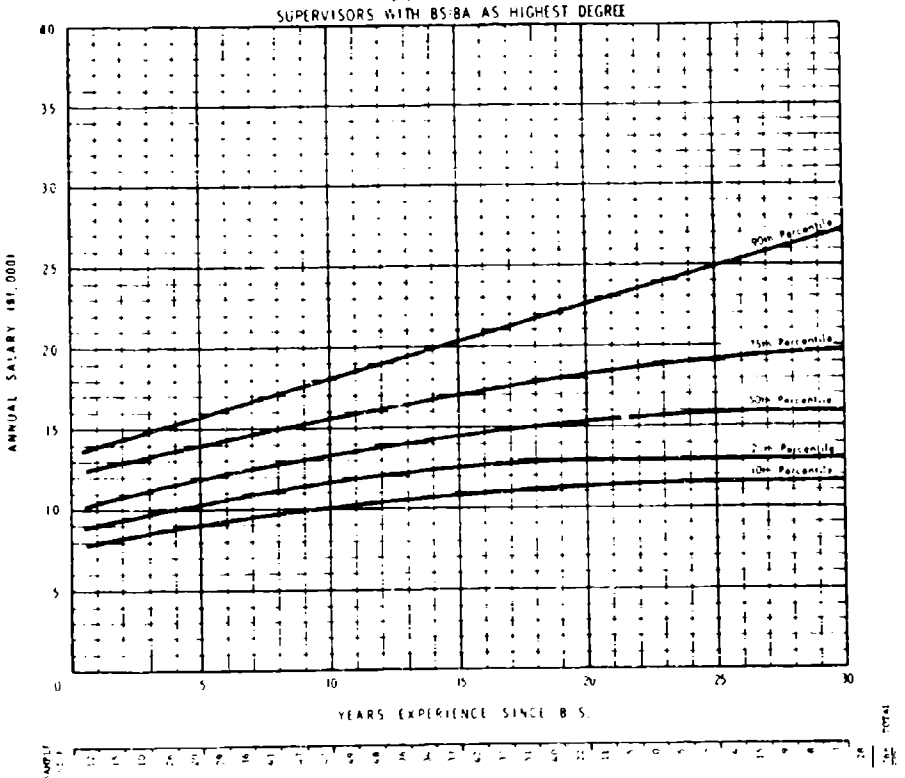
GRAPH 47 A
FACILITY MANAGEMENT
SUPERVISORS WITH PhD AS HIGHEST DEGREE



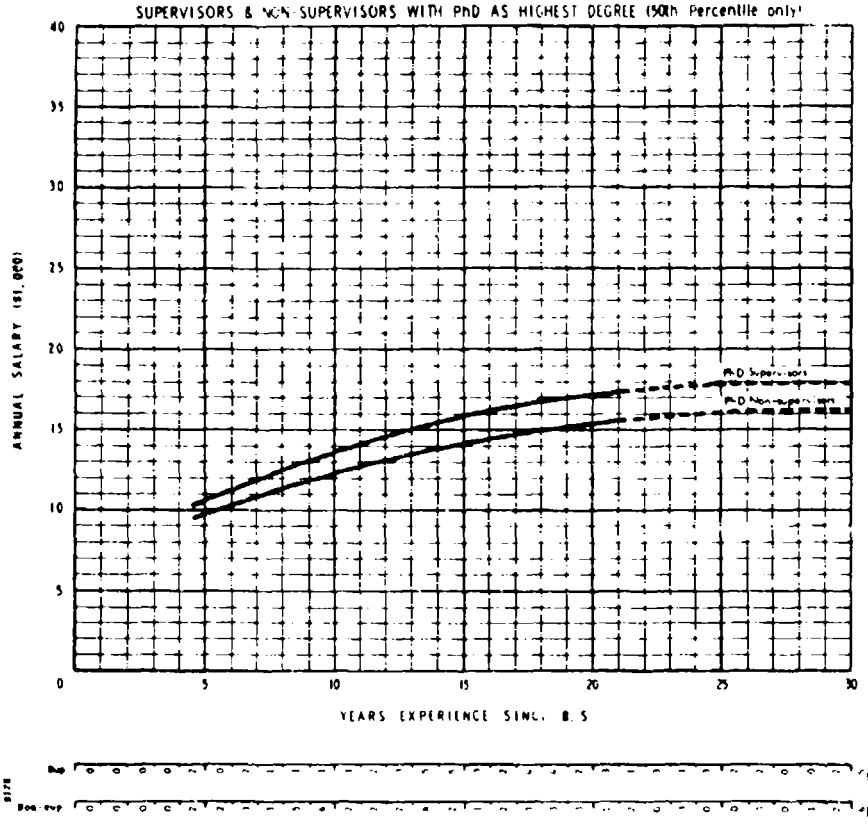
GRAPH 47 B
FACILITY MANAGEMENT
SUPERVISORS WITH MS-MA AS HIGHEST DEGREE



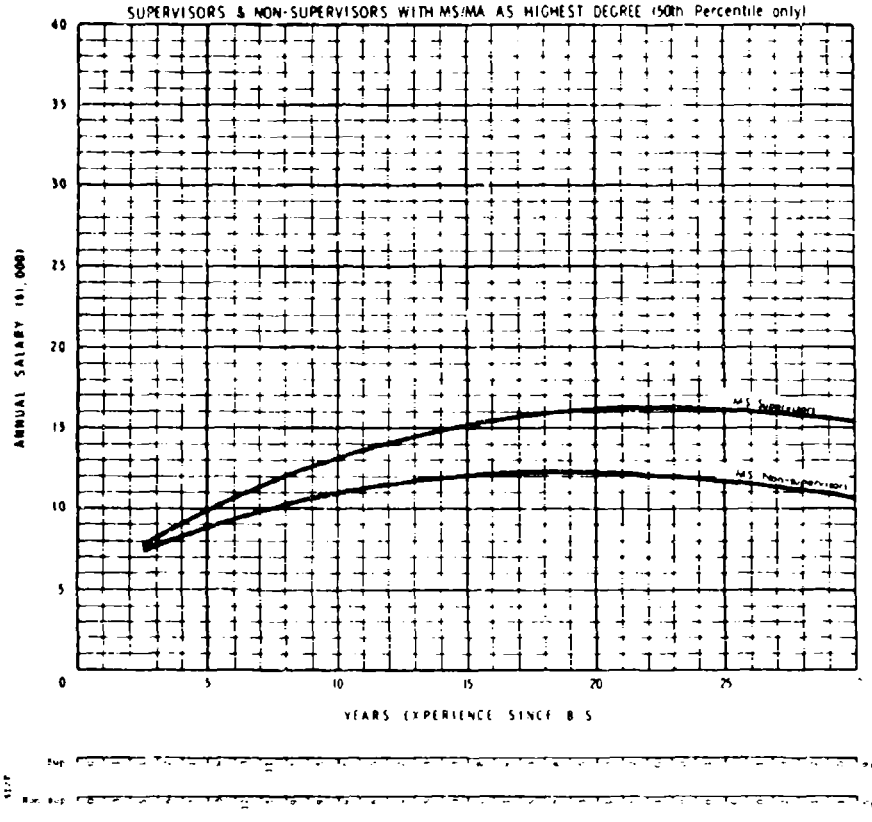
GRAPH 47 C
FACILITY MANAGEMENT
SUPERVISORS WITH BS-BA AS HIGHEST DEGREE



GRAPH 48 A
INSTRUCTION / TRAINING
SUPERVISORS & NON-SUPERVISORS WITH PhD AS HIGHEST DEGREE (50th Percentile only)



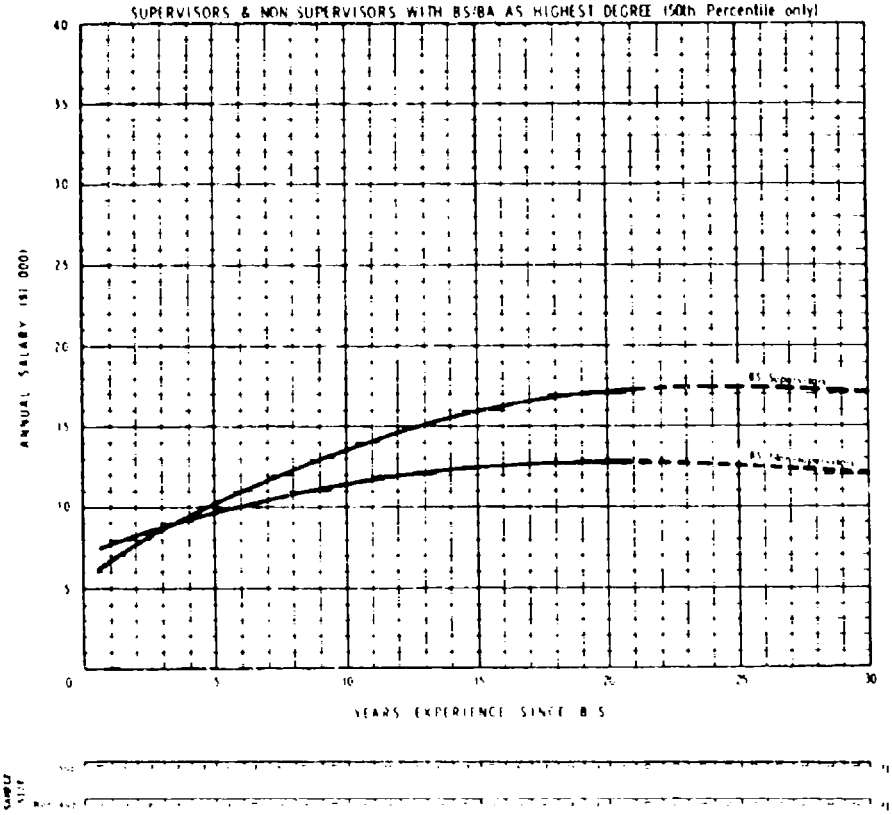
GRAPH 48 B
INSTRUCTION / TRAINING
SUPERVISORS & NON-SUPERVISORS WITH MS/MA AS HIGHEST DEGREE (50th Percentile only)



GRAPH 48 C

INSTRUCTION / TRAINING

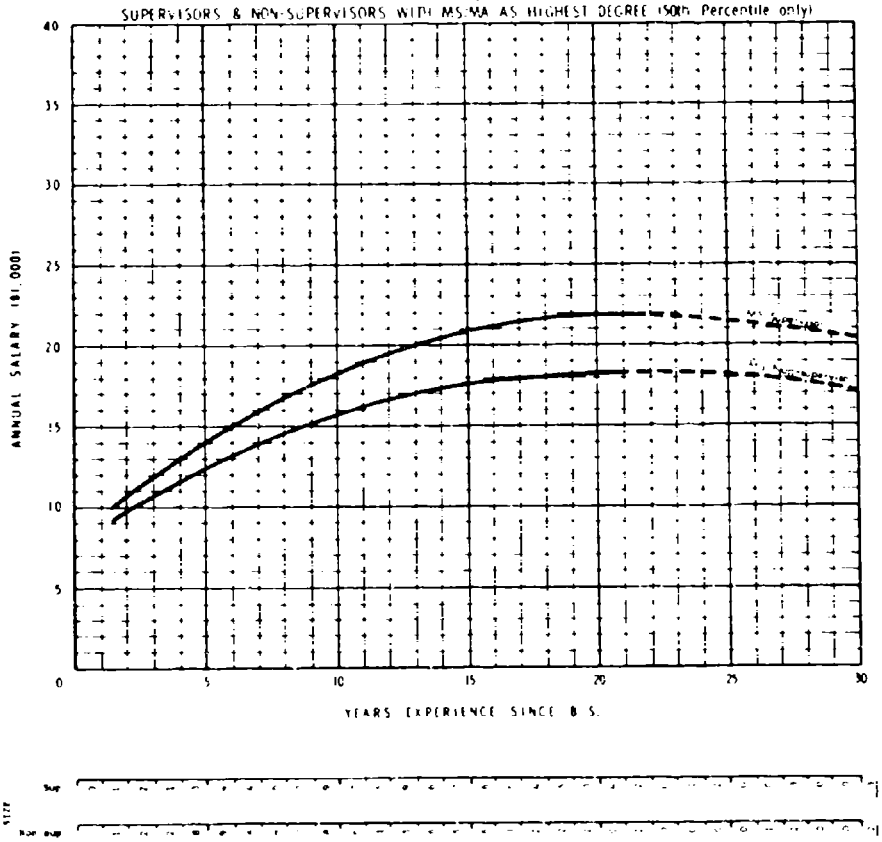
SUPERVISORS & NON SUPERVISORS WITH BS/BA AS HIGHEST DEGREE (50th Percentile only)



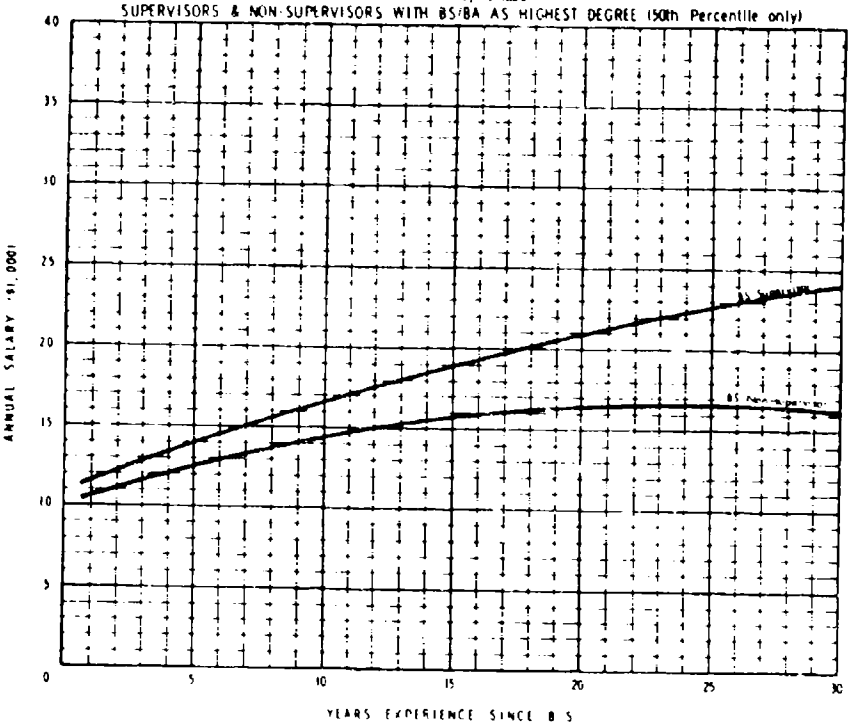
GRAPH 49 A

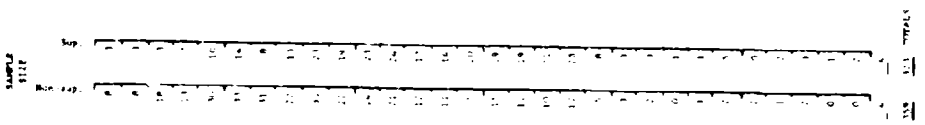
MARKETING, SALES

SUPERVISORS & NON-SUPERVISORS WITH MS/MA AS HIGHEST DEGREE (50th Percentile only)



GRAPH 49 B
MARKETING, SALES
SUPERVISORS & NON-SUPERVISORS WITH BS/BA AS HIGHEST DEGREE (50th Percentile only)





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13. ABSTRACT

This report presents tabular and graphic summaries of the data collected during a 1968 survey conducted by AFIPS of personnel engaged in the information processing field. The data were acquired by questionnaire. The questionnaire was distributed by seven professional society members of AFIPS to their memberships. The societies are: Association for Computing Machinery, American Society for Information Science, Institute of Electrical and Electronics Engineers, Special Libraries Association, Simulation Councils Inc., Data Processing Management Association, and Numerical Control Society. The survey reports on data from 29,076 questionnaires. The data pertain to the following five categories of information: personal data, education, employment, professional activities, salary and income. Among the respondents, 19% are in the 25-29 yr. age range, 22% in the 30-34 yr. range, and 29% in the 35-39 yr. range; 87% of the respondents are male. The respondents include 7.5% Ph.D.'s, 24% M.S.'s, and 37% bachelor's degree holders. The predominant discipline among degree holders at all levels is engineering; mathematics is second, and physical sciences third. The predominant occupational specialty is programming. The predominant areas of application of users are scientific and engineering, and business and administration. An extensive analysis is included of salary distributions to enable comparisons with other national and regional salary surveys of professional personnel.

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	ROLE	WT	ROLE	WT	ROLE	WT
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questionnaire						
professional societies						
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